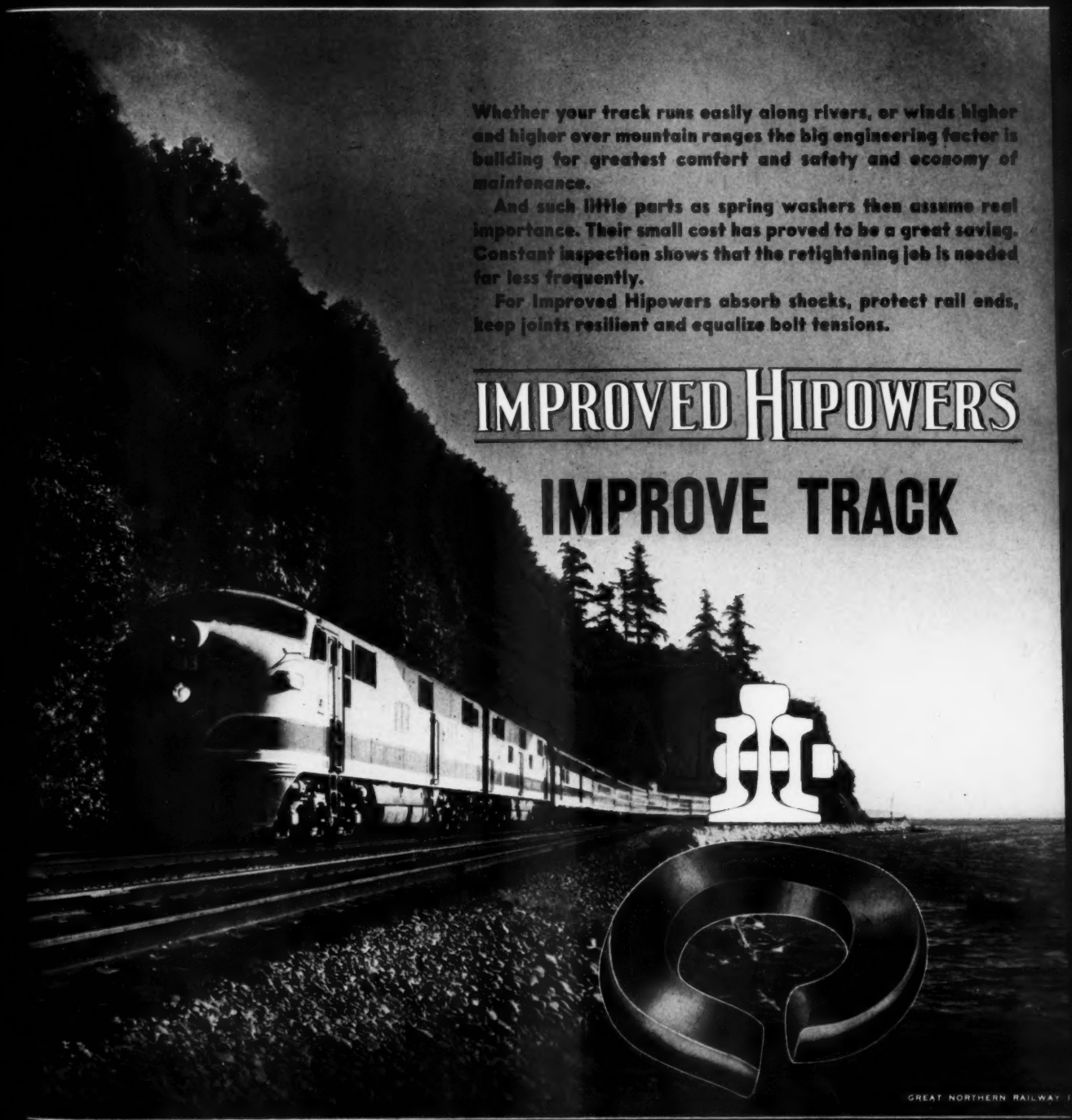
Engineering *and* Maintenance


Whether your track runs easily along rivers, or winds higher and higher over mountain ranges the big engineering factor is building for greatest comfort and safety and economy of *maintenance*.
And such little parts as spring washers then assume real importance. Their small cost has proved to be a great saving. Constant inspection shows that the retightening job is needed far less frequently.
For Improved Hipowers absorb shocks, protect rail ends, keep joints resilient and equalize bolt tensions.
IMPROVED HIPOWERS
IMPROVE TRACK
GREAT NORTHERN RAILWAY

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S.

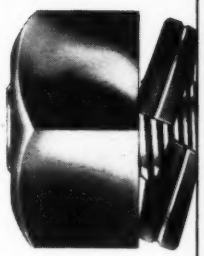
how RELIANCE hy-pressure hy-crome spring washers

hold maintenance costs *down*

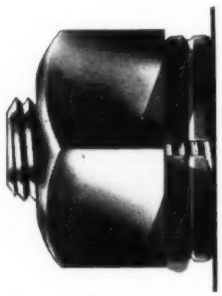
Reliance Hy-Pressure Hy-Crome Spring Washers act as hardened thrust bearings, permitting the application of greater tightening torque, while keeping joint assemblies under tension and retarding wear.

When Reliance Hy-Pressure Hy-Crome Spring Washers are tightened, the powerful reactive force stored up within the heat-treated helical-coil spring steel sections exerts constant and automatic pressure under the nut, keeping the assembly under tension despite wear and service stress. As a result, less maintenance tightening is required and a better rail-end condition and longer joint-bar life are obtained, reducing maintenance costs.

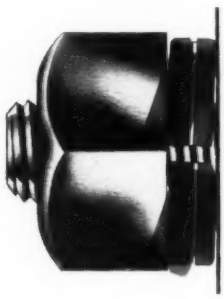
Convince yourself; use Reliance Hy-Pressure Hy-Crome Spring Washers on the toughest stretch of track and reduce your maintenance costs. There are other types of Hy-Crome Spring Washers for special railroad service application.



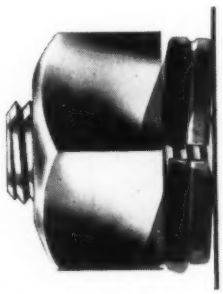
1. Nut makes first contact with Hy-Pressure Hy-Crome Spring Washer. Tightening compression begins.



2. Nut wrenched tight. Hy-Pressure Hy-Crome Spring Washer, fully compressed from original position shown in red, now exerts constant, non-fatiguing pressure against nut and joint bar.



3. After normal service wear. Note the reactive force still left in the Hy-Pressure Hy-Crome Spring Washer as indicated in red, keeping assembly under tension.



4. Nut backed off one-half turn. Note that the assembly is still under adequate tension as shown in red.

EATON

ATON MANUFACTURING COMPANY

EATON

RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

THE "OLD RELIABLE" OF SWITCH STANDS

Exposed view of adjustment device in the Model 51. When the stand is fully assembled with housing in place, the shims are reached by pushing aside outer cover on housing.

BETHLEHEM *NEW CENTURY*

For fifty years and more, New Century has been a trade name respected by railroad men wherever track is laid. This "old reliable" is probably the best-known switch stand ever made—and today's New Century, topping the family tree, stands out as the finest of a long line.

Especially popular is the Model 51 with the inner adjustment feature.* By means of a shim device, reached in a matter of seconds, switch-point adjustments can be made within the stand itself. It's all so simple and quick; nothing to complicate or slow the job. Merely loosen a nut and add or remove some shims; this increases or decreases the throw of the switch points.

Bethlehem's New Century is furnished in both low and intermediate designs. Use it with heavy rail (60-lb and up) in main lines, branch lines, and yards —wherever the volume of traffic is high.

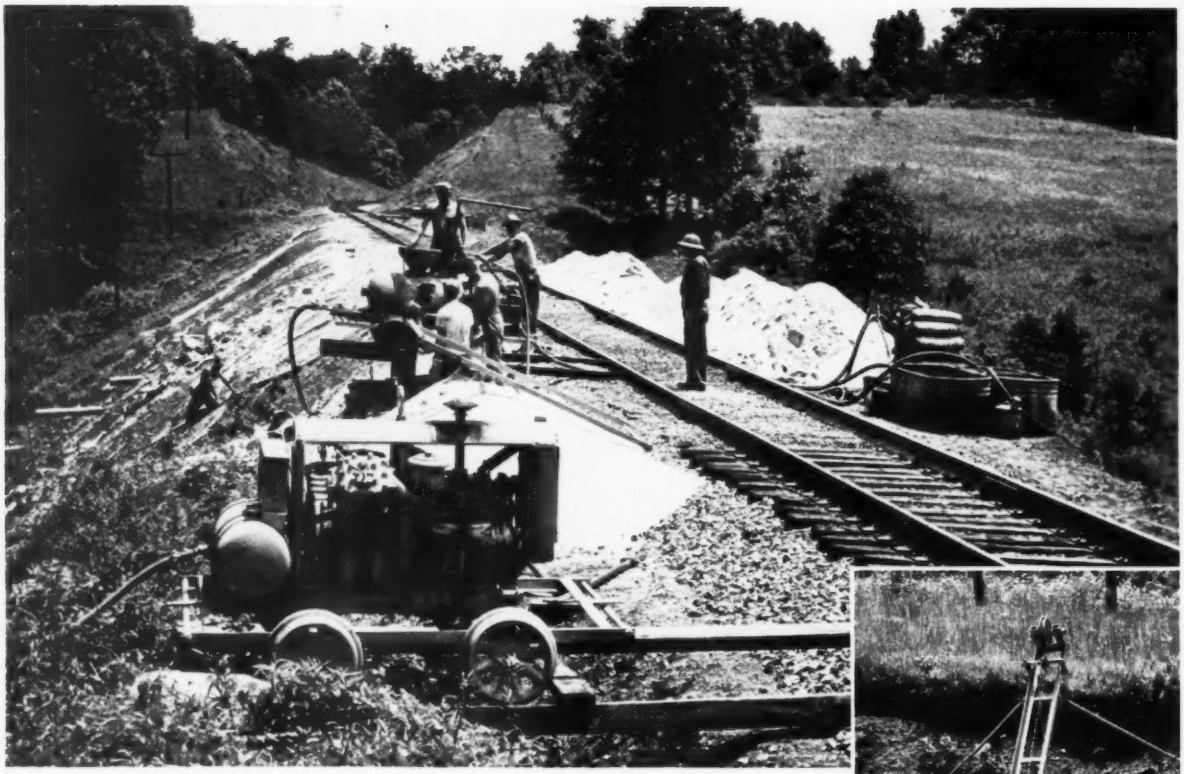
**The New Century is also available in non-adjustable type.*

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Marion, Ind., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill. Volume 46, No. 8.



PRESSURE GROUTING
speeds up traffic on the Virginian

In its 1949 maintenance program the Virginian Railroad stabilized by portland cement pressure grouting several sections of track that had required continual maintenance. One of these sections, a large fill 68 ft. high and 540 ft. long at Westgate, Va., supported a single track and required attention two to three times a week. It was not uncommon for the track in this section to drop several inches during heavy rains. As a result it was necessary to impose an almost permanent speed restriction of 12 mph.

The Virginian grouted one half of the fill first in order to compare its performance with the ungrouted portion. The grouted section gave such an excellent performance that the rest of the fill was grouted immediately.

Maintaining the entire fill before grouting cost an estimated $4,000 annually, excluding slow orders and miscellaneous items. The entire cost of the grouting operation is expected to be saved in about two years by reduced maintenance costs alone. Savings in ballast will increase this amount even more. Removal of slow orders and consequent improved train performance on a line handling 17 million tons of freight annually will be a further benefit.

More than 55 major railroads use portland cement pressure grouting to stabilize fills, eliminate soft spots, improve operating conditions, speed traffic and increase passenger comfort. Write for free technical literature, distributed only in the U. S. and Canada.

Upper photograph shows a general view of the fill and the pressure grouting operation at Westgate, Va. Several slips and squeezes are quite evident along the side of the fill.

Lower photograph shows a drop hammer device developed by the Virginian for driving injection points through tight ballast. The ram, weighing 350 lbs., is part of an old locomotive drive rod pin mounted on four wheels. It is pulled to the top of the track by a pulley and then dropped on the points.

PORTLAND CEMENT ASSOCIATION

DEPT. 8-27, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

In the heart of the job—
on America's Leading Railroads . .

THE leading railroads of the country have proved Northwests on their maintenance-of-way and storeyard jobs. The Northwest Crawler is a real railway man's machine. Its simplicity alone makes it worth considering. The rugged design and construction with its cast steel bases and cast steel machinery side frames, stands up under heavy railway service — keeps shafts in alignment — and reduces wear. Easy operation, the result of the "Feather-Touch" Clutch Control, increases operating safety and keeps the output curve up. Northwest steering and Northwest Crawlers, with their self-cleaning action, takes Northwests where other machines have difficulty and make loading and unloading easier.

You are making long-time plans. The Northwest is the machine for the heart of your maintenance-of-way jobs and you can't afford to have anything but the best in the heart of the job! Plan to have Northwests in those *Key Spots*. Make it the Key Machine and your first Northwest will make you a repeat order buyer.

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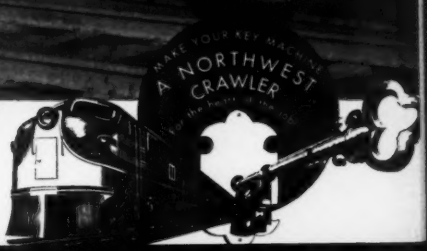
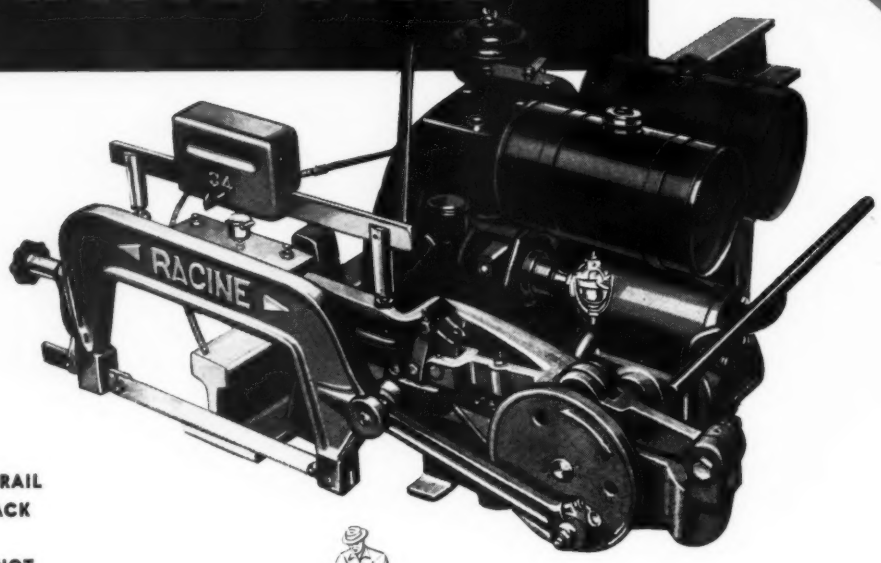
THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL



YOUR EXTRA EMPLOYEE THAT WORKS WITHOUT PAY

RACINE *Portable* RAIL SAW



- CROP RAIL IN TRACK
- WILL NOT SHATTER OR BURN RAIL ENDS
- CUT OFF ANY LENGTH DOWN TO 1/10"
- NO TRAFFIC INTERFERENCE

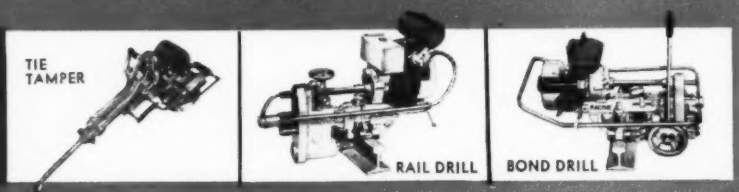
One man operates the RACINE Portable Rail Saw while it does the work of several hands. Designed specifically for cutting rail in track, it handles the job fast and dependably.

Cuts are smooth and accurate. Shattered and burned rail ends are eliminated. The possibility of rail failures from fractures that start with torch cutting or "nick and break" cropping is reduced.

Easily moved by two men, it does not hamper traffic. Operation is simple. Maintenance cost is low. Here is an "extra employee" you can rely upon for steady output under all conditions.

Write for new, 3-color catalog describing RACINE Railway Maintenance Machines.

OTHER RACINE PORTABLE MACHINES



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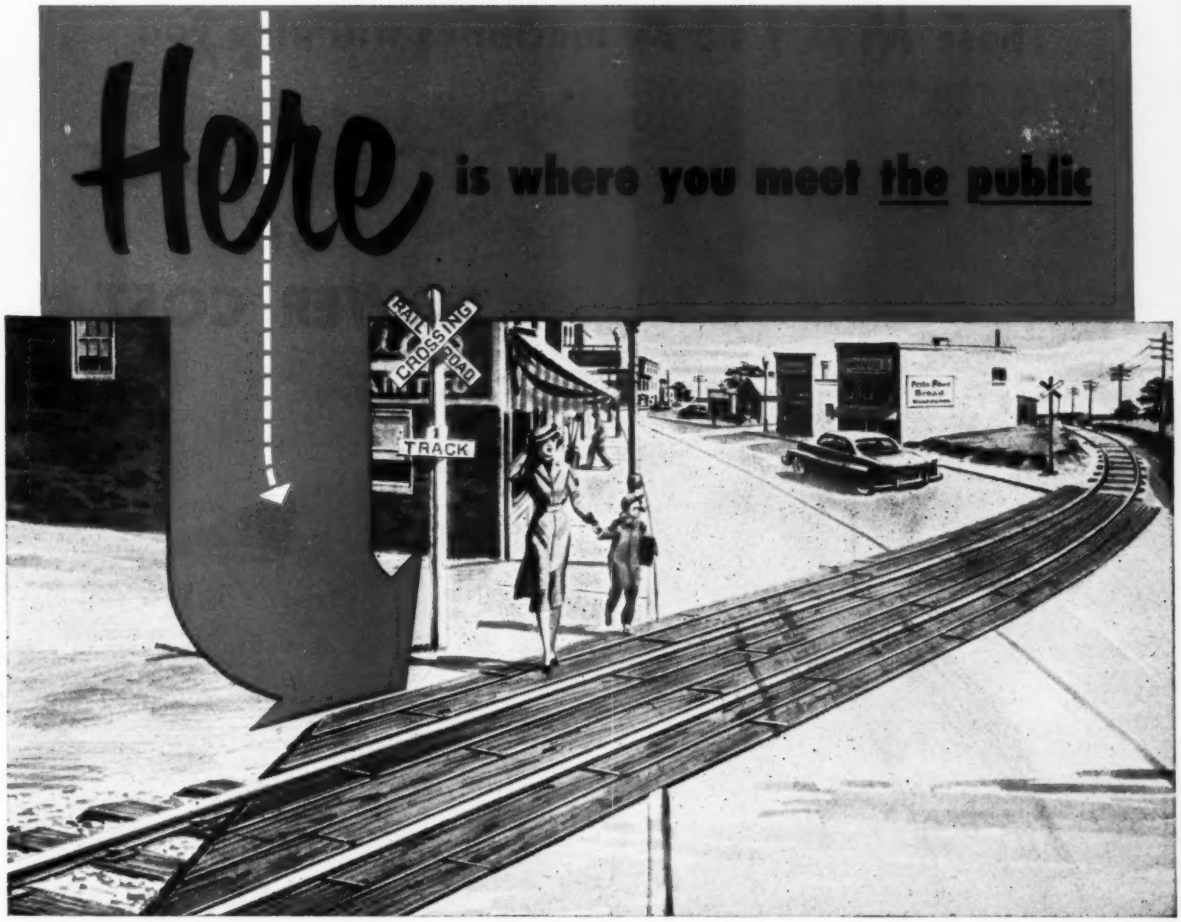

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For better public relations, specify crossings treated with PENTAchlorophenol.

PENTA is clean and leaves no offensive odor even in hot weather. It effectively protects planking, wood platforms, ties, and car lumber from decay and termites. Be "PENTA-PROTECTED" year around. For further information and technical assistance, write or wire Dow, Dept. PE 48A.

PENTA PROTECTS TIES! Newly adzed tie surfaces are protected by brushing or machine spraying with PENTAchlorophenol solutions. This is easily done with PENTA, even in coldest weather.

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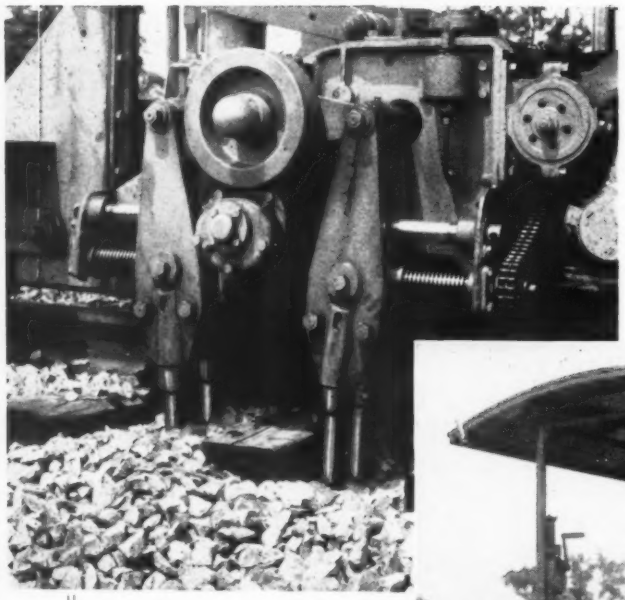
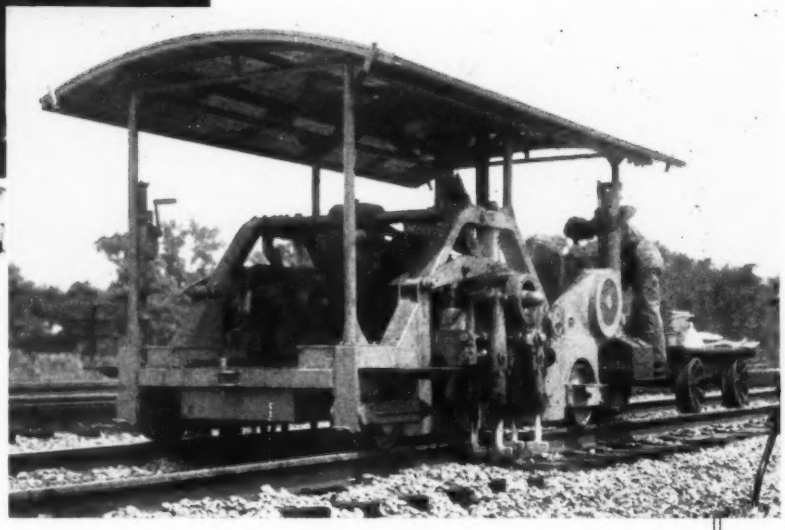
These MATISA machines will give you



BETTER TRACK at LOWER COST



MATISA
AUTOMATIC
TIE TAMPER

A self-propelled unit requiring only one man to operate, the MATISA Automatic Tie Tamper works at the rate of 350 to 600 ft. of track per hour.

The machine mounts two complete tamping mechanisms, one over each rail, each separately controlled. Each tamping unit comprises eight tamping tools, four inside and four outside the rail. The opposed pairs are positioned on each side of a tie, vibrating rapidly while being forced toward each other, until the desired compactness of ballast under each tie is obtained.

ALSO
Universal Bolt and
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Tie Drilling Machines
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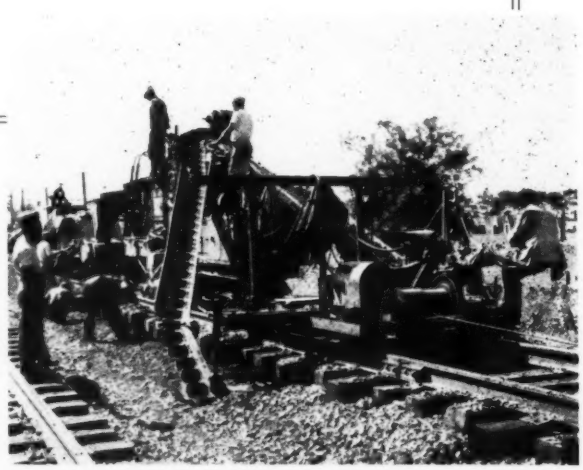
MATISA AUTOMATIC BALLAST CLEANER

This self-propelled on-track machine cleans up to 400 lineal feet of track per work hour. An endless scraper chain is run beneath the track structure, elevating the ballast to a series of conveyors and screens where it is cleaned and returned to the roadbed, while the waste dirt is ejected clear of the tracks.



Full details and work records on request.

The MATISA
EQUIPMENT CORPORATION
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EQUIPMENT COMPANY
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Rio de Janeiro, Brazil

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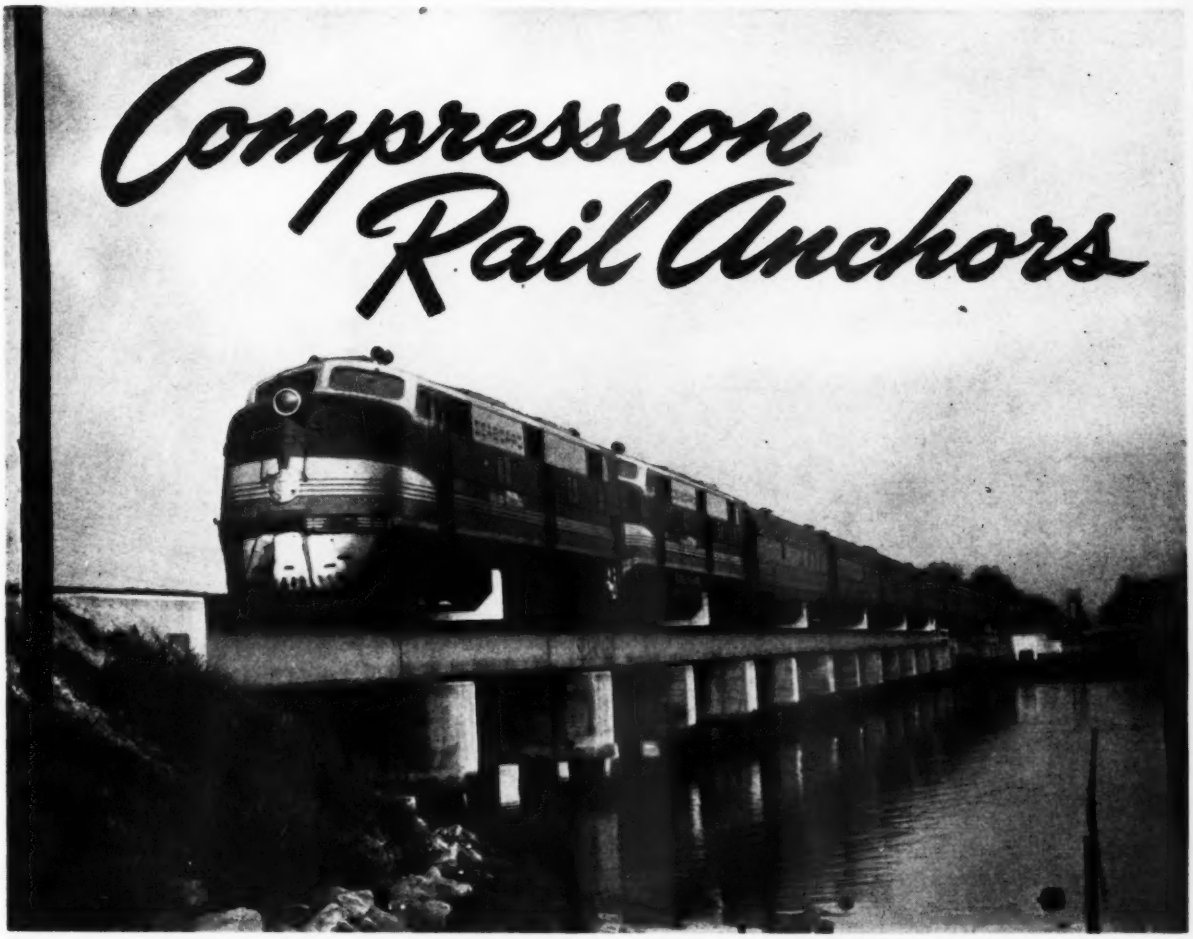
Compression Rail Anchors



Nowhere is firmly held track and uniform expansion more important than on bridges and viaducts. On these vital installations and on main line track, turnouts and crossings, Compression Anchors are providing efficient, economical two-way protection.

THE RAILS COMPANY

General Office
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BIG, POWERFUL LINK-BELT SPEEDER K-570

TAKES TOP OFF HUGE SOUTHERN RAILROAD YARD

Southern Railway's Yard at Atlanta is some two miles long and two city blocks wide. This entire area was lowered 8 ft. 8 in. by a Link-Belt Speeder K-570 Shovel-Crane, seen at work in the view above. For a job of this type the Link-Belt Speeder is unsurpassed, with its ample power, speed of operation, and the Speed-o-Matic hydraulic controls. Loading an 18 yard gondola in 2 minutes denotes its capacity for volume.

Keeping this up throughout the shift demonstrates the ease of control, rugged construction, and high productive capacity that are characteristic of Link-Belt Speeders.

On construction, right of way maintenance as well as for use in stores and repair shop, there's a crawler or wheel-mounted model and size to suit every purpose. There's a Link-Belt Speeder distributor near-by that will help you select the machines you need.

Be sure to see the

NEW HC-51

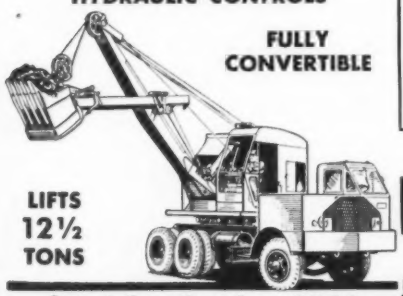
TRUCK-MOUNTED HALF-YARD SHOVEL-CRANE

WITH

SPEED-o-MATIC

HYDRAULIC CONTROLS

FULLY CONVERTIBLE



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Send for Catalog 2322

Speed-o-Matic hydraulic controls give operator perfect "feel" of the load, with accurate lift, swing, dump, either fast or slow, and without the slightest lost motion. Speed-o-Matic controls reduce wear and tear and prolong the life of the machine.

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LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of

SHOVELS-CRANES-DRAGLINES

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MULTIPLE TAMPERS

Now IMMEDIATELY AVAILABLE

ON TERMS TO SUIT YOUR PARTICULAR BUDGETARY REQUIREMENTS

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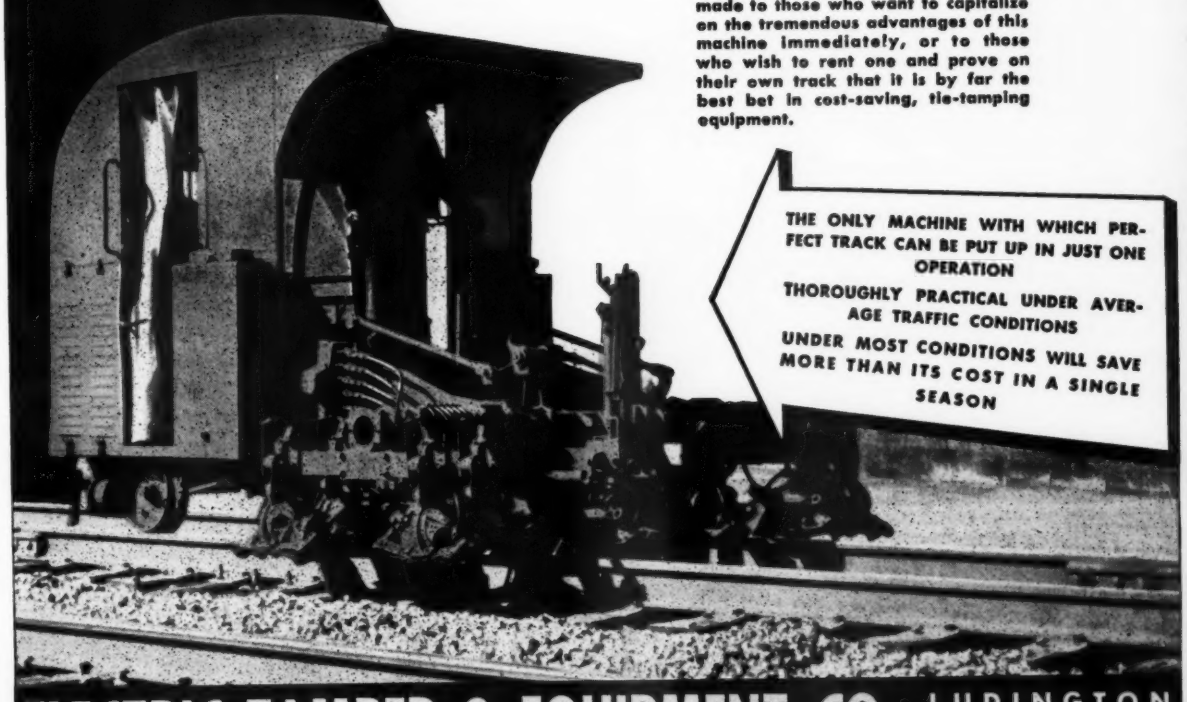
These universally successful tie tamping machines have already been selected and purchased by more than 45 leading railroads as the best means of achieving perfect track at the lowest possible cost per mile.

Write . . .

wire or phone for complete information. Prompt deliveries can be made to those who want to capitalize on the tremendous advantages of this machine immediately, or to those who wish to rent one and prove on their own track that it is by far the best bet in cost-saving, tie-tamping equipment.



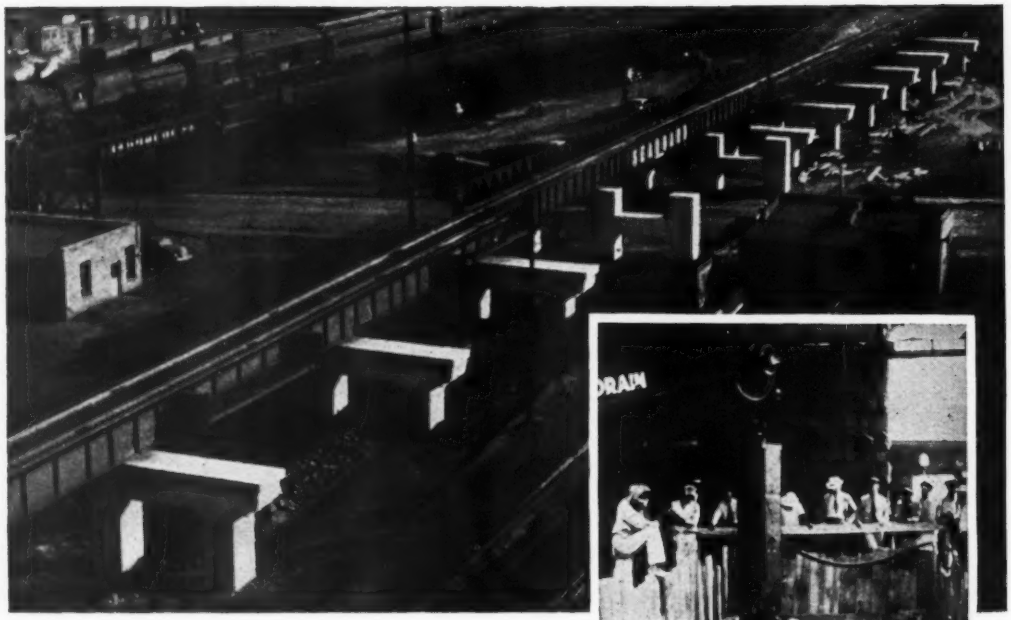
THE ONLY MACHINE WITH WHICH PERFECT TRACK CAN BE PUT UP IN JUST ONE OPERATION

THOROUGHLY PRACTICAL UNDER AVERAGE TRAFFIC CONDITIONS

UNDER MOST CONDITIONS WILL SAVE MORE THAN ITS COST IN A SINGLE SEASON

ELECTRIC TAMPER & EQUIPMENT CO. LUDINGTON MICHIGAN

HOW EXTENDIBLE **MONOTUBE PILES** LICKED LOW HEADROOM



. . . and saved a railroad *real* money!

TO increase rail capacity into Richmond, Virginia, the Seaboard Airline Railway Company found it necessary to redesign and install 59 piers large enough for double duty. Removing large portions of the old structure and re-routing traffic would have involved tremendous cost and delay. This was avoided by the use of Monotube Steel Piles. Readily extendible, the Monotubes were driven in 10-foot sections—driven *easily* in the many locations allowing only 20 feet of headroom.

Moreover, because Monotubes are light in weight, and easily driven to required bearing values, there was no need for heavy equipment! A light crane with standard equipment was able to work, with a flat boom, in and around the many obstacles . . . quickly, easily, saving still *more* time and expense. Thus 800 Monotubes averaging 20 feet in extended length were driven in only 50 days.

Low headroom is just one of many problems solved by tapered, fluted Monotubes. These modern cast-in-place piles, cold-rolled for high strength, offer exceptional stability and structural values. They come in lengths, gauges, tapers and sizes for varying soil conditions. Jobs started with Monotubes can be *finished* with Monotubes.

But get *all* the facts. Find out how Monotubes can help insure sound construction at minimum cost *whatever* your pile requirements may be. Write to The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

NO-OX-ID "A special" provides positive, one-coat protection to below-deck areas of bridges.

PROTECT BRIDGES WHERE RUST THREATENS WITH DEARBORN NO-OX-ID "A SPECIAL"

Bridge surfaces that are subject to corrosion that is accelerated by moisture, brine, live coal, cinders and locomotive gases need positive protection.

A completely reliable, thoroughly tested and inexpensive method is Dearborn NO-OX-ID "A Special." It's simple, too. Expensive preparation of metal surfaces is unnecessary . . . you don't need power tools or sandblast equipment. Just wire-brush the surface to remove loose paint film and rust scale. Then brush on a single coat of NO-OX-ID "A Special."

For every problem in rust prevention there is a NO-OX-ID solution. A Dearborn engineer will gladly discuss your problem.

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THE ORIGINAL RUST PREVENTIVE

NO – OX – ID
IRON + = RUST

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A copy of "NO-OX-ID for Maintenance of Steel Structures in the Railroad Industry" will be sent on request. Mail the coupon.

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Please send a copy of "NO-OX-ID for Maintenance of Steel Structures in the Railroad Industry."

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STEELOX construction is so simple it is unique. Individual wall and roof panels provide both structural framework and finished surface. Assembling them into a sturdy, weather-tight structure is easy and economical with just a small unskilled crew. What's more, should conditions change, your STEELOX Building can be quickly dismantled, moved and re-erected without loss of material.

Long life is assured because STEELOX is made from 18- and 20-gage Armco ZINC-GRIP-PAINTGRIP Steel. This durable material is two to three times as heavy as ordinary galvanized siding and roofing. Maintenance is sure to be low as there is nothing to go wrong—nothing to crack, warp or rot.

You'll like Armco STEELOX Buildings for motor car garages, offices, bunk houses and many other railroad needs. Write for prices and other data. Armco Drainage & Metal Products, Inc., 3300 Curtis St., Middletown, Ohio. Subsidiary of Armco Steel Corp.

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We changed from steam to an **Industrial Brownhoist Diesel Crane**

It paid for itself in four years!

Here are the figures to prove it:

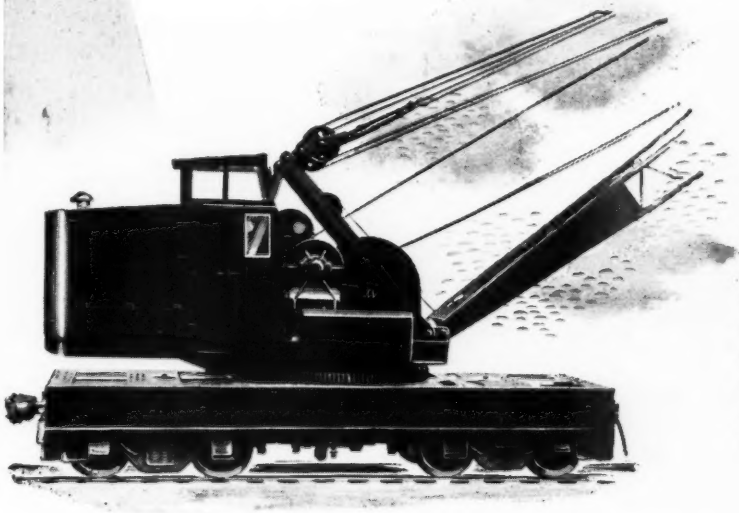
SAVINGS IN FUEL PER DAY $13.40
(Based on 1½ tons coal per day at $10 a ton, against 16 gallons of fuel oil at 10¢ a gallon.)

SAVINGS IN LABOR PER DAY $15.50
(Unproductive firing, banking, cleaning time
— 2 hours for engineer at $1.75 per hour, and
8 hours fireman, at $1.50 per hour.)

TOTAL FUEL AND LABOR SAVINGS PER YEAR.. $7,514.00

AND WE INCREASED OPERATING TIME BY 65 DAYS A YEAR!

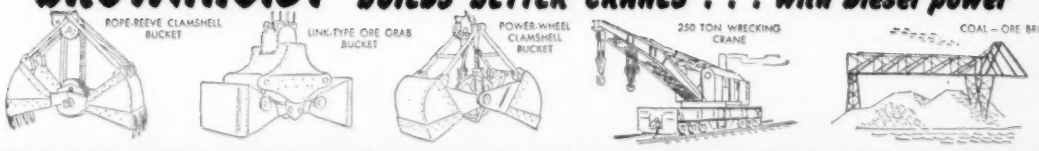
It takes two hours a day on the average for firing up, banking, taking coal and water, boiler washouts, etc. That figures to 10 hours a week, 520 hours a year, or 65 extra days of productive crane time each year.



BESIDES THESE IMPORTANT EXTRAS:

Safer, cleaner operation; greater production and less operator fatigue because of air operated controls; reduced maintenance time, about one-half that of steam, and elimination of smoke nuisance and fire hazard. Write today for complete information.

BROWNHOIST BUILDS BETTER CRANES . . . with Diesel power



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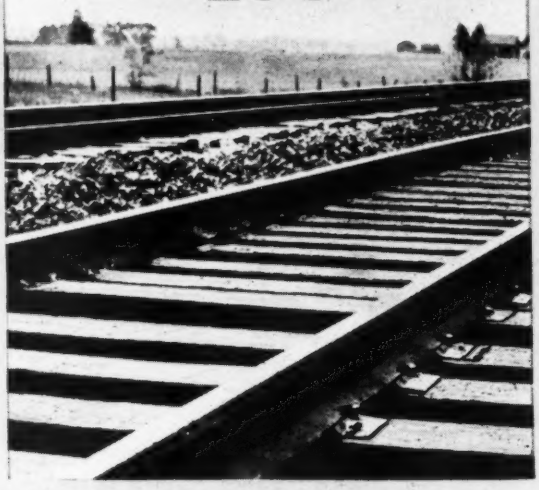
HAND-CRIBBING COST PER MILE $1214.00

VS.

MACHINE-CRIBBING* COST PER MILE $264.40



That's how the Pullman-Standard *POWER TRACK CRIBBER *pays for itself!*

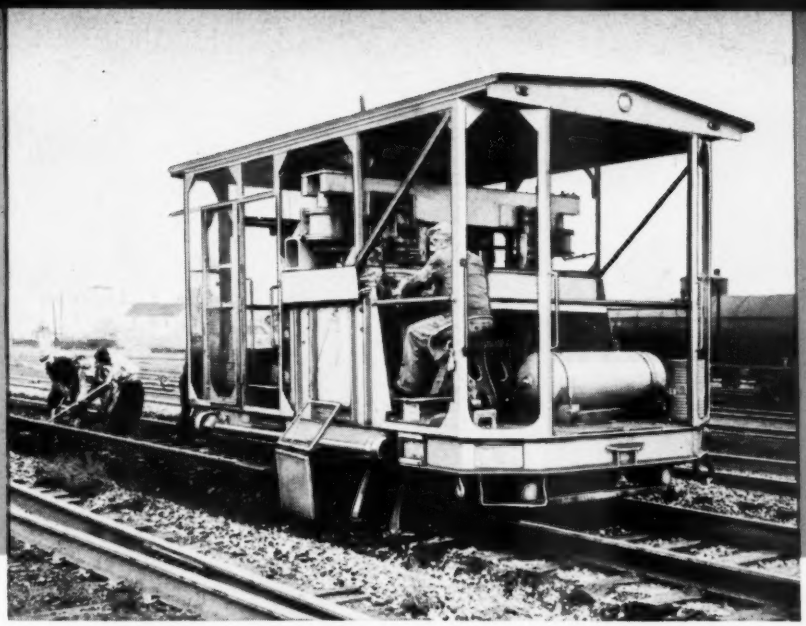
The cost figures above (based on rates *before* Sept. 1, 1949) came straight from a leading railroad that has used Pullman-Standard Power Track Cribbers for several years. And note this—for machine-cribbing they *include* interest on investment, depreciation and maintenance, fuel and oil.

That's economy on a major scale. Also, it's economy coupled with a *better job of cribbing*. The Pullman-Standard Power Track Cribber works with mechanical precision—crib after crib, mile after mile. Cribs are uniform in depth; profiles are uniformly sloped for proper drainage. And mechanized *speed* minimizes interference with line operation.

It doesn't take *long* for a Pullman-Standard Power Track Cribber to *pay for itself!* It's a self-liquidating investment that *today*, more than ever before, warrants closest examination by progressive railroad management.

Pullman-Standard
CAR MANUFACTURING COMPANY
POWER BALLASTER DIVISION
79 East Adams Street, Chicago 3, Illinois

BIRMINGHAM 3, 1004 First National Building • CLEVELAND 15, 907 Midland Building • PITTSBURGH 19, 1115 Gulf Building
NEW YORK 17, 52 Vanderbilt Avenue • WASHINGTON 6, D. C., 1025 Connecticut Avenue, N.W.
SAN FRANCISCO SALES REPRESENTATIVE: MARK NOBLE



Speedy... Powerful!

The Pullman-Standard Power Track Cribber can crib out from 170 to 250 feet of track per hour, depending on ballast condition. It travels to and from location under its own power, at a speed of 25 miles per hour. Complete setoff requires only 3 to 5 minutes.

TO GIVE TRACK THE "FULL TREATMENT"

Cribbing, ballast cleaning, and tamping may *all* be mechanized with Pullman-Standard track-maintenance equipment. Cribber, cleaner, and ballaster may be operated in production-line sequence, to give track the "full treatment" if desired. An important eastern road reported recently that two cribbers, followed by a cleaner and a ballaster, renovated their mainline track at the rate of 450 to 600 feet per hour!

● The Pullman-Standard Ballast Cleaner cleans and replaces both cribbed-out and shoulder ballast, without fouling adjacent track.

Available in 3 Ways

Pullman-Standard track-maintenance equipment is offered on terms calculated to meet any railroad's budgetary program:

1 **By outright purchase.**
2 **On installment terms.**
3 **By rental, with purchase option.**

Railroads are invited to write or call for full particulars.

● The Pullman-Standard Power Track Ballaster tamps track more firmly and uniformly than is possible by any other method.

"Track at Its Level Best" describes and pictures these money-saving machines. Write for a copy of this 24-page brochure.

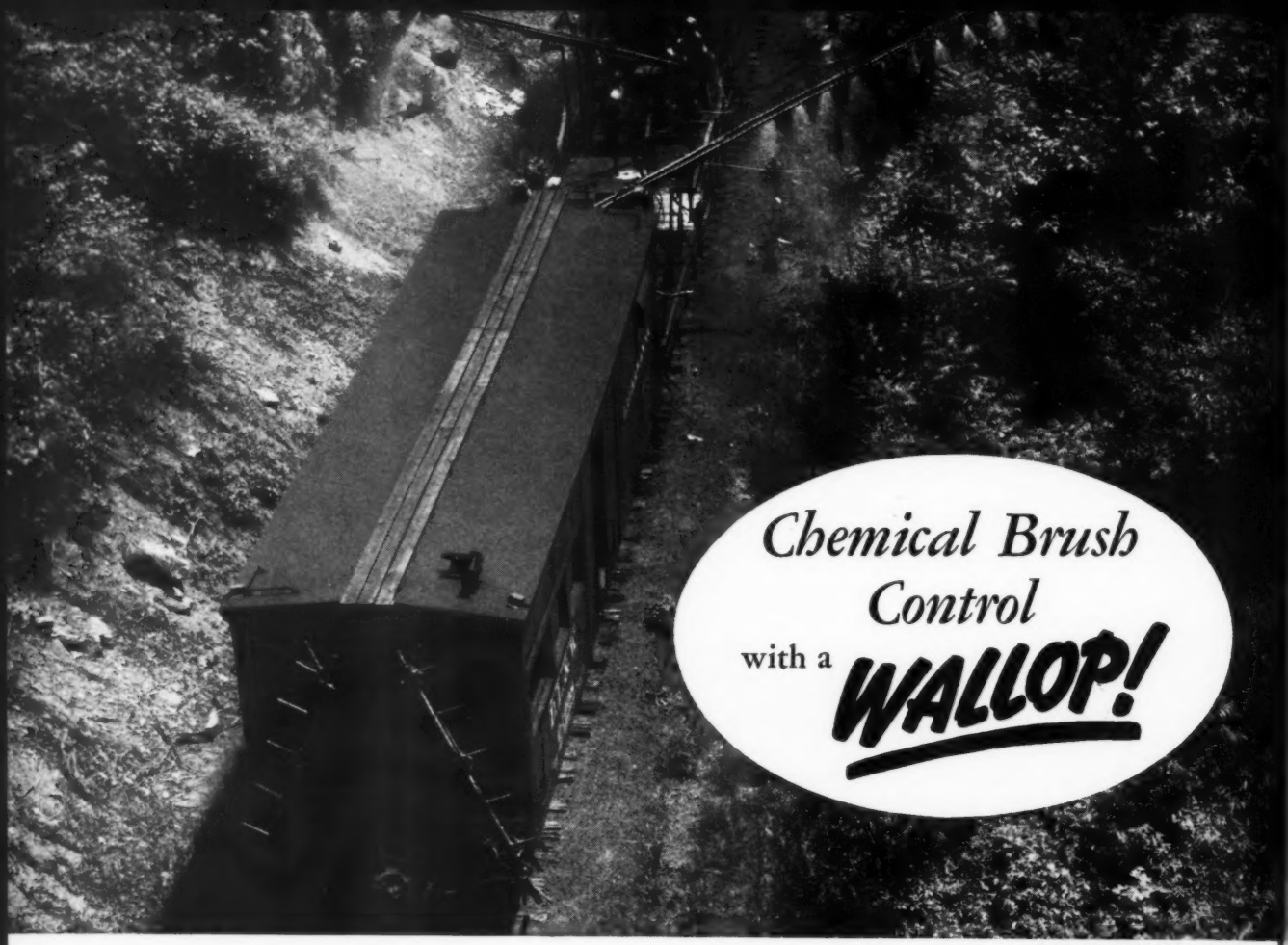


PHOTO COURTESY OF D. L. & W. R. R. CO.

ESTERON BRUSH KILLER

Yes, Esteron Brush Killer packs a wallop! This hard-hitting Dow formulation (4 pounds acid equivalent per gallon) now contains the more powerful low volatility esters of 2,4-D and 2,4,5-T—effective on a wider variety of brush and weeds. Easy and economical to use as a foliage spray, Esteron Brush Killer gives good control of alder, ash, birch, brambles, cherry, elm, hickory, maple, oaks, osage orange, poison ivy, sumac, willow and other hard-to-kill species. It is effective also in controlling resprouting of stumps when it is applied in oil immediately after cutting.

A wealth of information on clearance and maintenance of right-of-ways with chemicals is yours on request. Dow sales and technical men are available for consultation and assistance on *your* vegetation control problems—from grass and weeds in the ballast to heavy brush on the right-of-ways.

Agricultural Chemical Division

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

Also recommended for woody plant control is Esteron 245. For controlling grasses such as Johnson, quack and Bermuda—use Dow Sodium TCA 90%. No fire hazard—and treated foliage presents no poison hazard to grazing cattle.

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

PENDABLE DOW AGRICULTURAL CHEMICAL PRODUCTS

AND GRASS KILLERS • INSECTICIDES • FUNGICIDES
D PROTECTANT • PLANT GROWTH REGULATORS

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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First Class Permit No. 32418, Sec. 34.9, P.L.&R. Chicago, Ill.

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New York 7, New York

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Woodworking Equipment----- 740

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August, 1950

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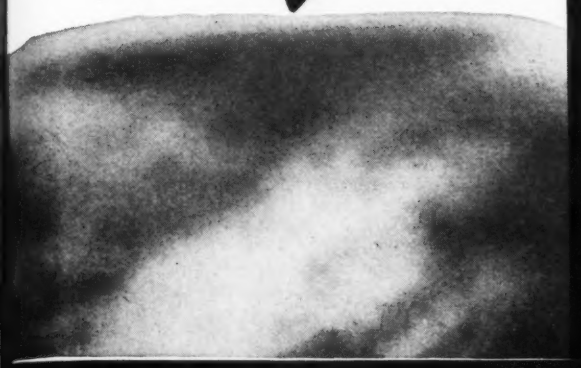
This Year It's a Must.....



FOR THE ROADMASTER, THE MAINTENANCE OF WAY AND THE BRIDGE AND BUILDING MAN – TO ATTEND WITH AS MANY OF HIS STAFF AS POSSIBLE!

1950 it's the first joint exhibit and convention since 1942 and there won't be another 'till 1952!

It's a long time between shows—not just for you—but **for exhibitors, too!** That's why, for 1950, suppliers have been creating the **biggest show of its kind ever to be held in the history of railroading!**

That's why, too, this mammoth exhibit has been moved to the **Coliseum**—a few blocks south of convention headquarters in the Stevens Hotel—to give elbow room to the visitors and plenty of room for **operating** and **demonstrating** equipment to the many, **many more exhibitors** who will present their products this year!

It's going to be a year of heavy planning and policy-making for the railroads. This meeting comes just before budget time —and it's the first meeting since the 40-hour week took effect!

So, find out what top-thinking is going to be b tween now and 1952! And, for a well-informed staf plan to have as many as possible attend—*above a* be sure you and your staff *visit the exhibits. Th year they are an education in themselves!*

Make your plans NOW around these impor tant dates in your road's future . . .

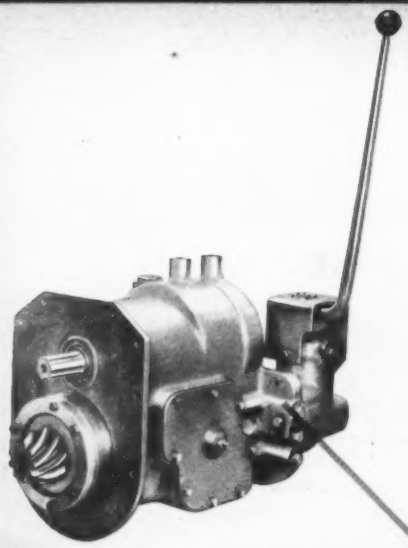
THE COLISEUM. New, larger exhibit headquarters—just few blocks from The Stevens, lovely lake-front conventi headquarters. The Coliseum will be the scene of the *greate exhibit of its kind ever held.* Some startling new and i proved equipment will be presented. A lot will happ between now and '52. *Get your head-start at these exhibit*

Manufacturers! There's still time and there's always good space at the Coliseum! Contact

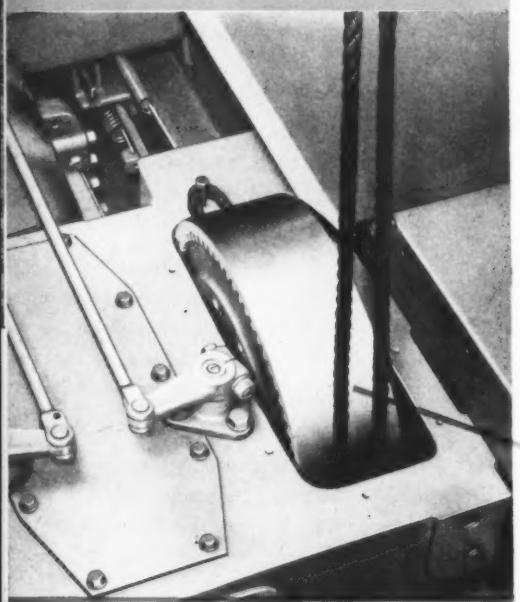
TRACK SUPPLY ASSOCIATION
BRIDGE & BUILDING SUPPLY MEN'S ASSOCIATION
Room 702, 59 East Van Buren St., Chicago 5, Illinois

Allis-Chalmers Design

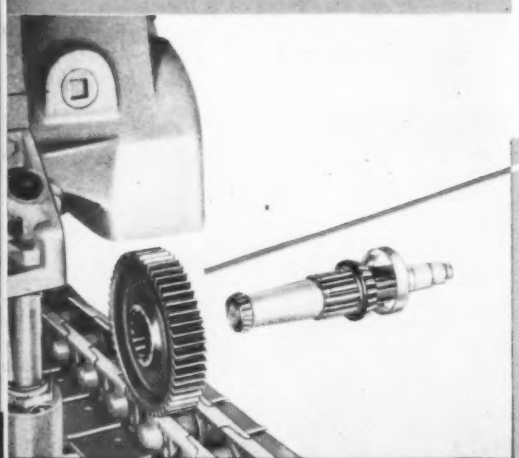
Another big reason why HD-5 leads in tractor output



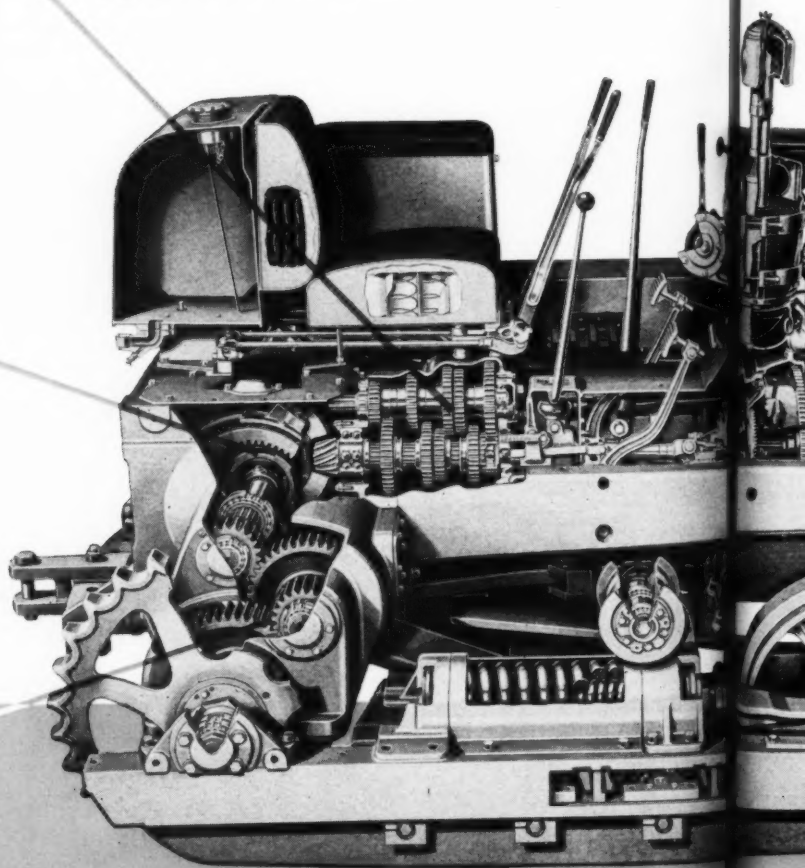
Transmission can be removed as a complete unit without removing clutch, final drive or bevel gear.



Each steering clutch can be removed independently and without removing final drive pinion or bevel gear.



Final drive gear and intermediate gear can be removed without disturbing steering clutch.



More Reasons For HD-5 Top Performance

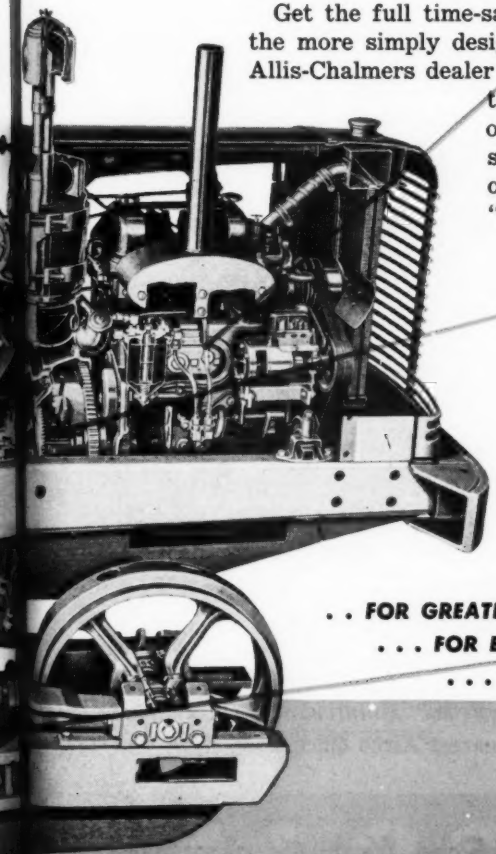
- ✔ Exclusive Positive Seal 1,000-Hour Lubrication of truck wheels, track idlers and support rollers
- ✔ 11,000 lb. of Balanced Weight
- ✔ Greater Operator Comfort
- ✔ 2-Cycle Diesel Engine — 40.26 drawbar hp.

Simplicity

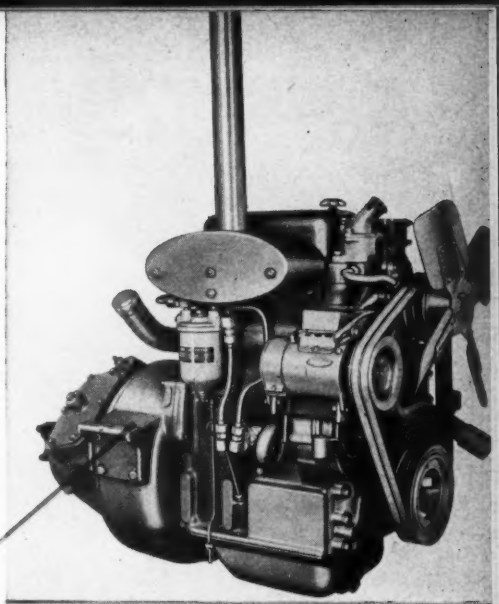
Simple unit assembly is another important reason why the HD-5 is low in total down time required for servicing and maintenance — why it is tops in output per day, per month, per season.

When maintenance is necessary, each assembly is readily accessible for attention. The HD-5 is designed so that each major unit may be easily removed and repaired or replaced *right on the job* without removing unrelated parts. The time and labor saved means substantial increases in the HD-5's overall output. Remember — a tractor makes money for an owner only when it's working!

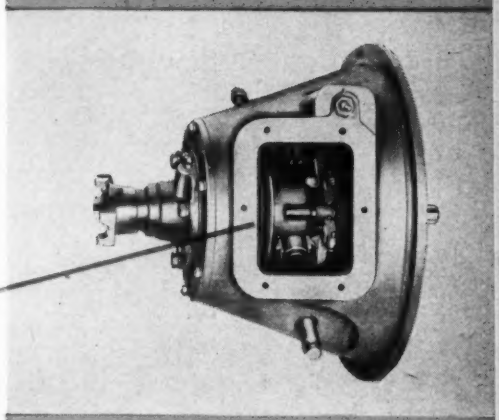
Get the full time-saving service story on the more simply designed HD-5 from your Allis-Chalmers dealer . . . NOW! Ask him, too, for a practical demonstration . . . a demonstration under your own operating conditions. "Seeing Is Believing."



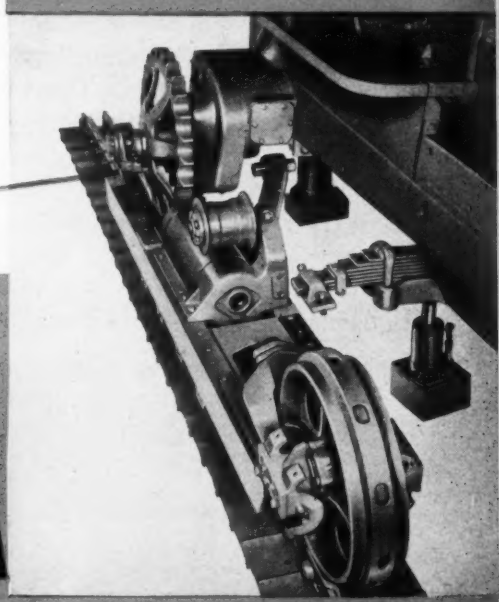
. . FOR GREATER PRODUCTION
. . . FOR EASIER OPERATION
. . . FOR SIMPLIFIED SERVICING



Engine can be removed without disassembling clutch.



Clutch assembly can be removed without disturbing engine or transmission.



Truck frame can be dismantled without removing final drive, sprocket or equalizer spring.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U.S.A.

The last of the "Big Freeze"

Today, a leading mid-Western railroad is using a unique and economical method of preventing joint bars freezing to rail ends.

Employing oxyacetylene flame cleaning, mill scale, rust and surface moisture are effectively removed from new and relay rail ends. This, plus a special oil treatment assures a long-lasting, corrosion-resistant surface – a surface that in itself eliminates metal to metal freezing.

The operation is carried out just behind the rail laying crane. The ends of the rail within the area of the joint bars are flame cleaned with an oxyacetylene torch, equipped with a special Airco tip. After applying the flame, the rail is wire brushed and oiled with a special preservative while it is still warm. The joint bars are then positioned and bolted into place.

One torch operator and helper is able to flame clean 280 rail joints in eight hours by this method . . . at a unit cost of about 16¢ per joint.

• • • •

For more information about flame cleaning and other cost saving methods as applied to railroad maintenance work, simply write for the 46-page booklet, "Oxyacetylene Flame Processes and Arc Welding in Railroad Maintenance Operations." Address your nearest Airco office.

Costs Come Down Under the Airco Plan

AIRCO **AIR REDUCTION**

Offices in all principal cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

COSTS LESS TO PUT UP . . . practically *nothing* to maintain

Here's a new all-metal building sheet that can help you set new construction records. Alcoa Aluminum Building Sheet weighs only 56 pounds per square. Workmen can erect more per day using only standard tools and methods.

Where painting is difficult and costly, aluminum roofing and siding save money—immediately on first costs and continuously on maintenance. Think about this, then figure your next job with Alcoa Aluminum Building Sheet.

Alcoa Building Sheet is immediately available with all correct fasteners and accessories for easy assembly. For application and engineering details, call your nearby Alcoa sales office, listed under "Aluminum" in your Classified Telephone Directory. Or mail the coupon.

FACTS FOR CONTRACTORS AND ENGINEERS

Alcoa Industrial Building Sheet may be erected over steel or wood purlins or girts. It may be fastened by nails, purlin nails, straps, clips, screws or weldable studs.

Lengths: 5 to 12 feet. Widths: Roofing, 35 inches. Siding, 33⅓ inches.

Thickness: .032 inches—equal to 22 U. S. Gauge.

Available for prompt shipment with all types of fasteners, flat and preformed flashing.

For complete details MAIL THIS COUPON, TODAY

Aluminum Company of America
1470H Gulf Bldg., Pittsburgh 19, Pa.

Please send me engineering and application data on Alcoa Industrial Building Sheet.

Name_____

Company_____

Address_____

City_____ State_____

ALCOA

ALCOA ALUMINUM

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT-MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

Why 2 more Great Northern trains...

...the new RED RIVER

...the new INTERNATIONAL

STONEFELT, in blanket form, is easily applied between car walls during construction.

have passenger comfort "sealed-in" with Johns-Manville STONEFELT Insulation

ONE OF THE MOST important features for passenger comfort designed into these beautiful, new Great Northern streamliners by American Car and Foundry Company is Stonefelt—the blanket-type insulation that's "hidden" in the structure of the car walls.

For the car builder, Stonefelt is easily and economically applied during construction. *For the railroad,* its excellent insulating qualities help cut air-conditioning and heating costs. In addition, Stonefelt will not settle or deteriorate once in place between the car walls, and is fire-resistant. *For passengers,* it not only keeps car temperatures constantly comfortable, but also muffles external noises to a whisper.

If you would like further information about Stonefelt . . . and an estimate on how economically it can "seal-in" passenger comfort for your cars . . . write Johns-Manville, specialists in passenger car insulation. Address Box 290, New York 16, New York.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville 92 YEARS OF SERVICE TO TRANSPORTATION

For additional information, use postcard, pages 703-704

How TIMKEN® bearings help 210 men get places in a hurry

THE Northwestern Motor Company gang car shown below seats 10 men comfortably. And it can haul another 200 in trailers. It's designed and built with outstanding strength—for transporting men fast, dependably, without delays.

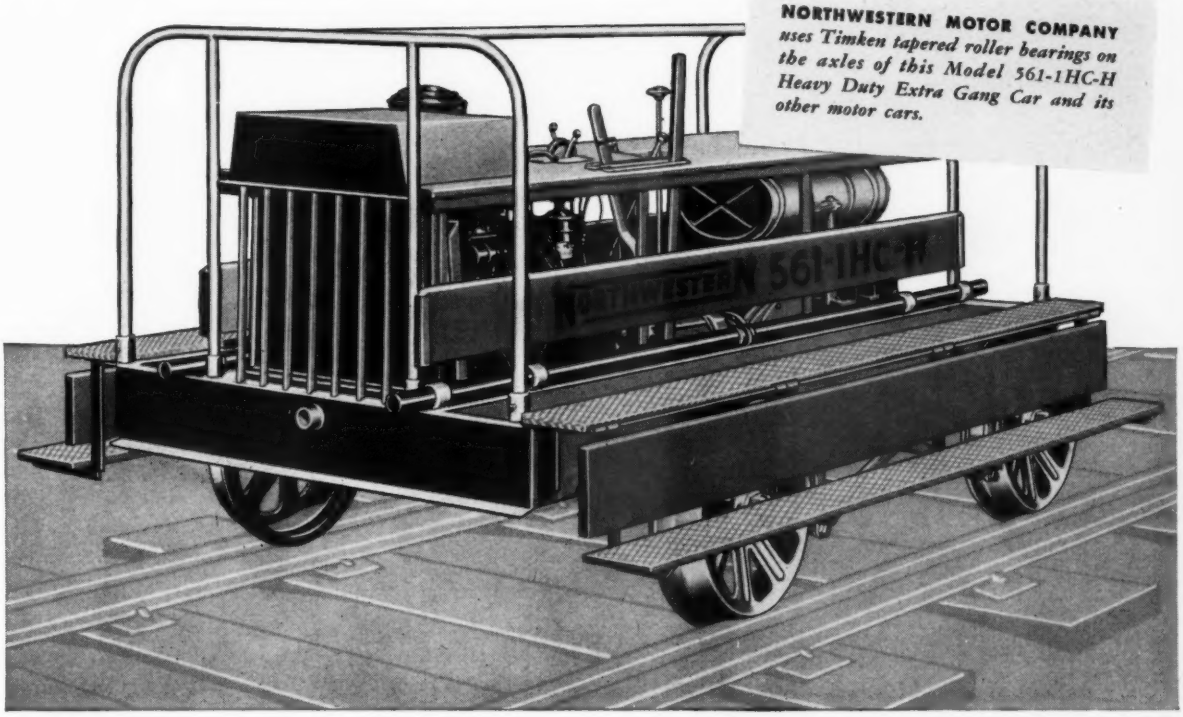
One of its main heavy-duty construction features is the Timken® tapered roller bearings on the axles. Timken bearings keep moving parts in alignment, reduce wear on the axles and wheels and help prevent breakdowns. They cut friction almost 100%. They reduce maintenance and in-shop time, increase car availability.

Line contact between the rolls and races of Timken bearings gives them tremendous load capacity. That goes for *all* loads—radial, thrust and combination—thanks to the tapered roller design of Timken bearings. And Timken bearings normally last the life of the machine because they are (1) engineered for the job, (2) made of Timken fine alloy steel and (3) precision manufactured.

Bearings are an extremely important part of any machine. Make sure the machines *you* build or buy have the best. Look for the trademark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

NORTHWESTERN MOTOR COMPANY *uses Timken tapered roller bearings on the axles of this Model 561-1HC-H Heavy Duty Extra Gang Car and its other motor cars.*



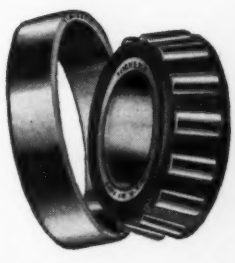
DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roll ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

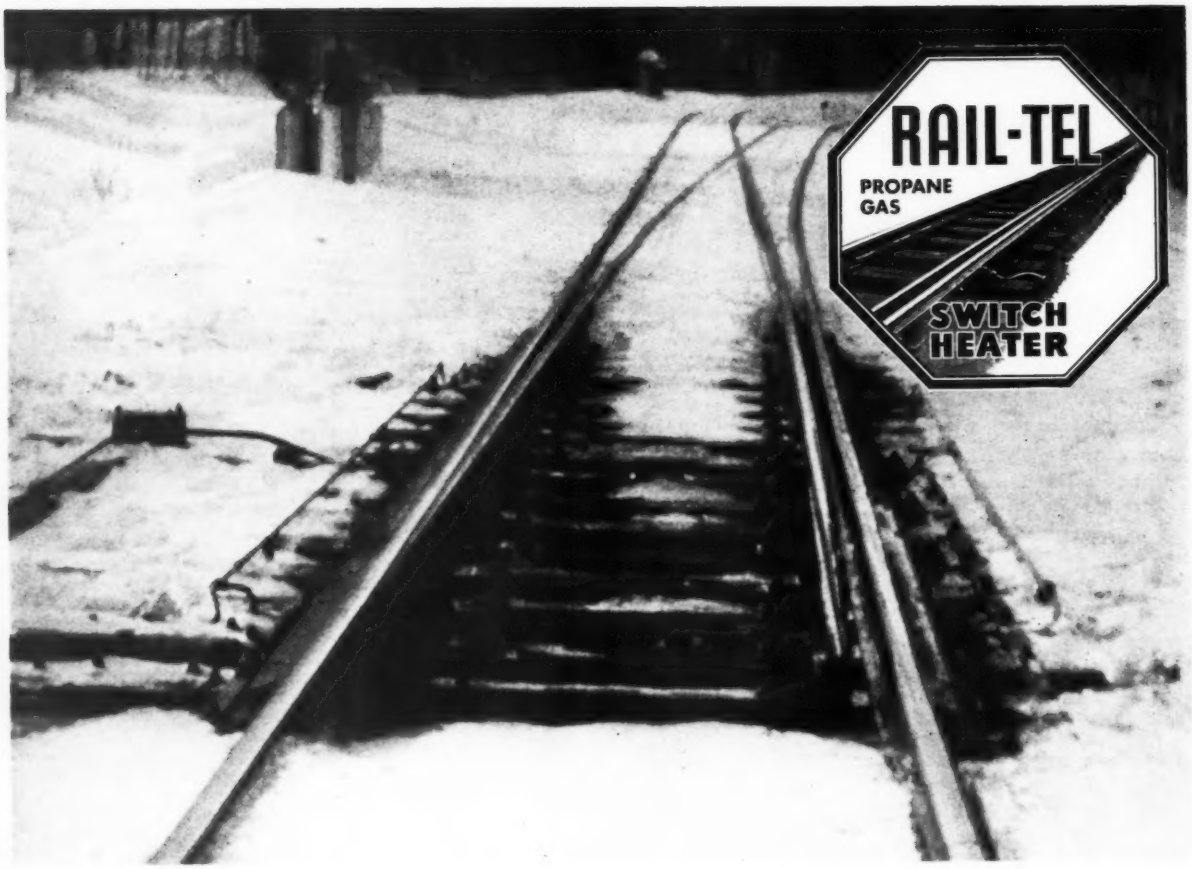
The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◎ AND THRUST ◎ LOADS OR ANY COMBINATION



Low Cost Winter Protection For Switches

Control box and supply cylinders for Rail-Tel remote control installation.

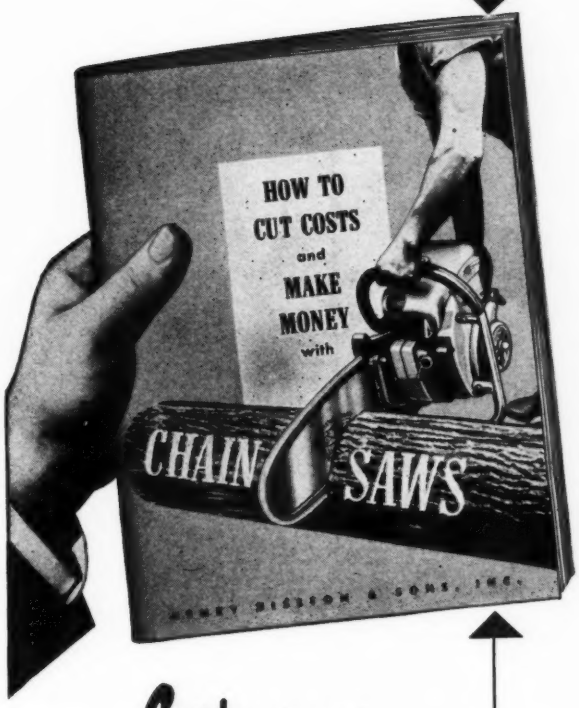
The past two critical winters have proved the efficiency and economy of propane gas in keeping switches free of snow and ice. Rail-Tel installations on representative roads are responsible for important savings.

Now is the time to prepare for unhampered operation in the months ahead. Rail-Tel Switch Heaters provide unfailing, economical protection in busy terminals and yards and out along the line—particularly where C.T.C. territory is involved. Available in both manually operated and remote controlled assemblies, these heaters are ruggedly built and easy to install. Write for complete information.

THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.



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This BIG 36-page book is packed full of pictures and profitable tips about cutting timber and cutting costs

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I would like very much to have a free copy of your book "How To Cut Costs and Make Money with Chain Saws."

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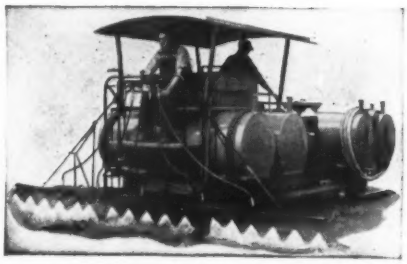
Mechanized maintenance promotes Soo Line Service

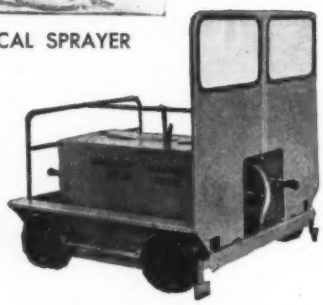
Maintenance engineers on the Soo Line, — the shippers' "working partner 7 days a week", — employ modern machines to help keep their right of way in good condition for carrying heavy Diesel-powered trains under daily pressure.

In this work they use WOOLERY Machines; WOOLERY Chemical Sprayers to keep tracks clean of vegetation; WOOLERY Tie Cutters to speed tie replacements economically; WOOLERY Motor Cars for heavy duty all along the line.

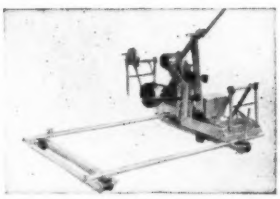


WOOLERY CHEMICAL SPRAYER

PIONEER MANUFACTURERS OF RAILWAY MAINTENANCE EQUIPMENT SINCE 1917



WOOLERY NO. 300 MOTOR CAR gives advantages of a light car, plus greater pulling power with 4-wheel drive (with differential when needed), and heavy duty performance. Carries 8 men and track tools. Can be fitted with detachable WOOLERY Flangeway Cleaner for winter duty.



WOOLERY TIE CUTTER and Undercarriage enables one man to quickly cut each worn tie into three easily removable pieces without disturbing ballast. Entire cutting operation is performed without lifting or turning machine. Total cutting time is less than two minutes per tie.

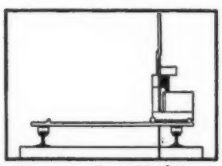


Figure 1 — Making first cut at right end of tie, close inside rail.

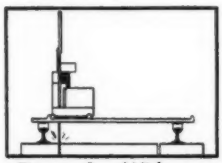


Figure 2 — With machine moved to left end of tie, making second cut.

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WOOLERY MACHINE COMPANY

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Pioneer Manufacturers of RAILWAY MAINTENANCE EQUIPMENT

RAILWAY WEED BURNERS • MOTOR CARS • FLANGEWAY CLEANERS • TIE CUTTERS • TIE PLATE SPACERS • RAIL JOINT OILERS • CREOSOTE SPRAYERS

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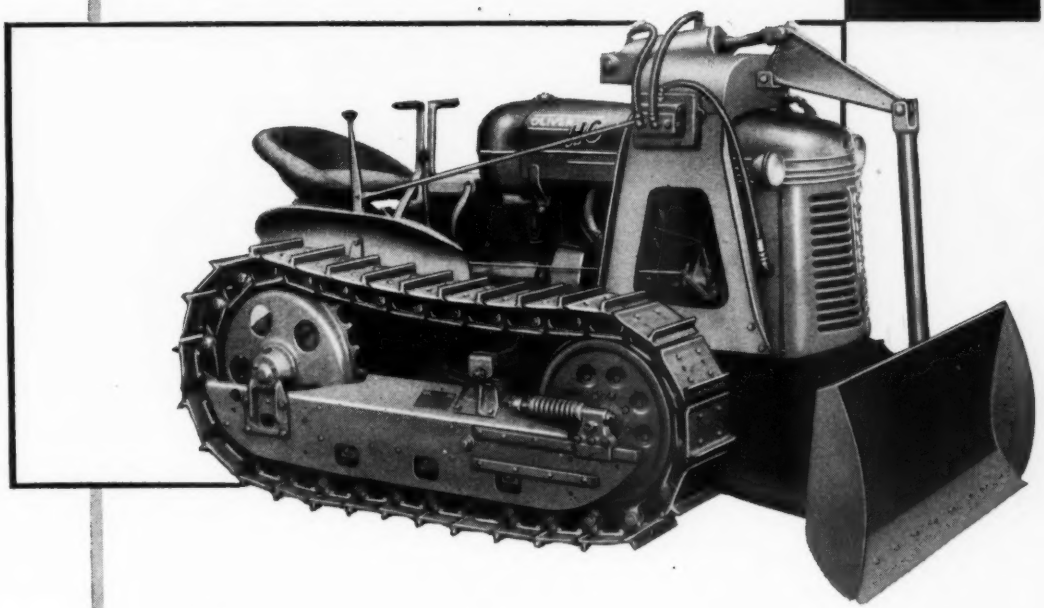
More *strength . . .* **More** *power . . .* **More** *everything*

..in the NEW OLIVER "HG"



There's *more* of everything you want in a crawler tractor in the NEW Oliver Model "HG." This new little crawler tractor is "big" with performance-making features because it was *field designed* . . . designed to meet the specifications that users said they wanted.

The NEW OLIVER "HG" Has More Strength

To handle the extra load and strains of mounted equipment, the main frame, transmission case and drawbar bracket assembly have been materially strengthened. No loads are imposed on final drive spacer casting. Power take-off is heavier . . . stronger.

Front wheels have been increased 50% in material thickness for longer life. Wheel flanges are on the outside of the track rails for better track alignment. New, heavier type track frame guide supports and buffer springs add strength to handle mounted equipment.

Final drive has been redesigned for greater physical strength and durability.

The NEW OLIVER "HG" Has More Power

The new "HG" engine gives you more drawbar horsepower . . . extra power to handle bigger loads . . . extra efficiency.

Check the new Oliver "HG" at your Oliver Industrial Distributor's now. It's the biggest little tractor you've ever seen.

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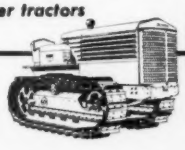
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of industrial wheel and crawler tractors



Be sure to read the article on Page 640 of the July issue of this magazine . . . for complete resume of one railroad's experience with the Libbey-Zone Process . . .

Cut Bridge Fire Expense...

INVESTIGATE THE

LIBBEY-ZONE PROCESS

Leading Roads Achieving Remarkable Success in Restricting Bridge and Trestle Fire Damage . . .

EASY TO APPLY — LASTS FOR YEARS

The photographs at the left were selected at random from our files. Many leading railroads (names furnished gladly upon request) are now restricting fires on wooden structures with the effective Libbey-Zone Process. One large system, whose experience is covered in the article on page 640 of the July issue of this magazine, has now treated over a thousand structures with highly gratifying results.

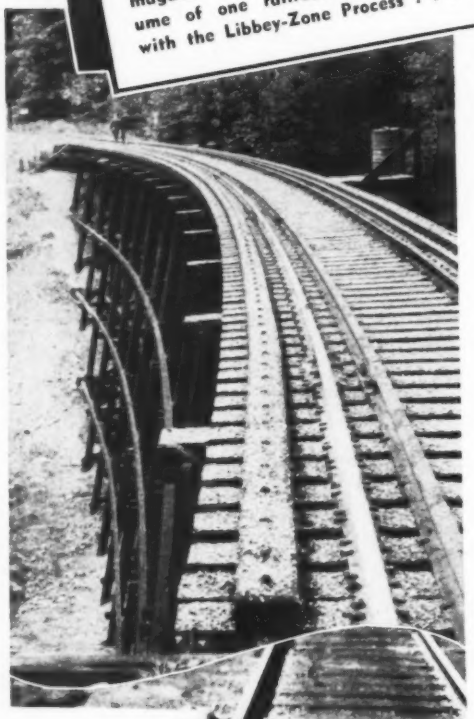
Every open deck timber bridge presents its own fire hazard. Brake slivers, fuzees, cigarettes, flaming fuel drippings from locomotives . . . all find a ready fire target on exposed, untreated wood surfaces.

"ZONE" HEAVY-DUTY COATING, when combined with the proper aggregate of crushed stone or gravel, expands with heat . . . yet does melt; contracts with cold . . . yet does not flake! Applied cold, the compound's resilient protective coating stretches over cracks and sinks into low spots, yet maintains an even spread and holds aggregate firmly in place. "ZONE" HEAVY-DUTY COATING is easily and quickly applied by unskilled workers. Investigate the money-saving advantage of "ZONE" HEAVY-DUTY COATING. Write today for descriptive literature and full data.

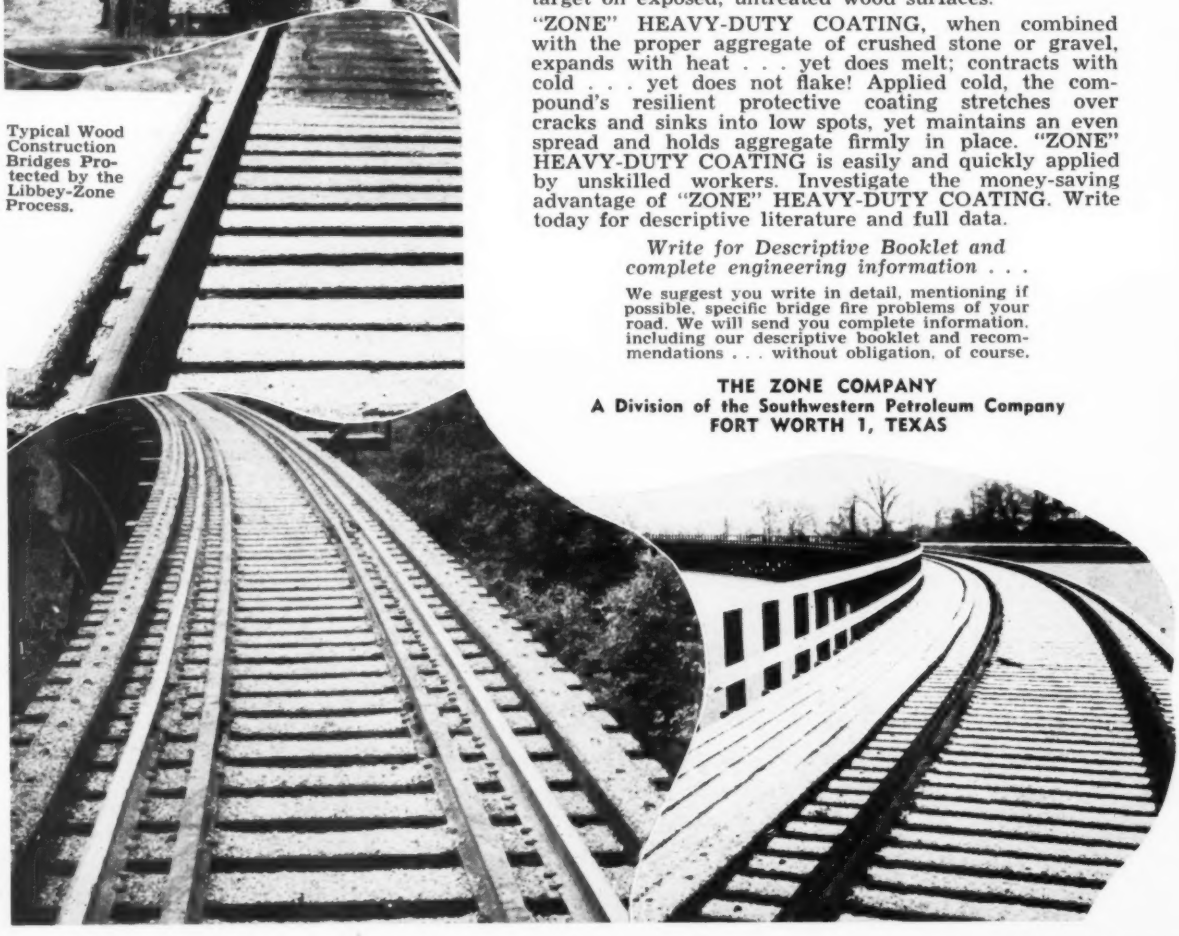
Write for Descriptive Booklet and complete engineering information . . .

We suggest you write in detail, mentioning if possible, specific bridge fire problems of your road. We will send you complete information, including our descriptive booklet and recommendations . . . without obligation, of course.

THE ZONE COMPANY
A Division of the Southwestern Petroleum Company
FORT WORTH 1, TEXAS



Typical Wood Construction Bridges Protected by the Libbey-Zone Process.



How to lay those long Rails

WITH

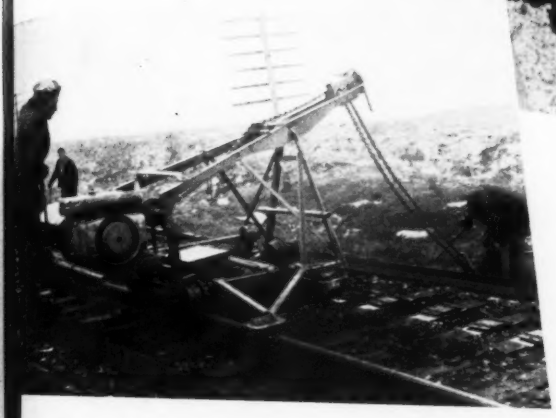
IMPROVED

TYPE "C"

MECO

RAIL LAYERS

in pairs



Improved low-cost, light-weight, high-capacity Type "C" *Meco Rail Layers* are towed to the job, but are self-propelled during the rail laying operation.

The two Improved Type "C" MECO RAIL LA pictured are working as a team. Manned by in rienced operators, they are lifting 78 ft. rail laying them at a speed of 30 to 40 per hour el time. This illustrates the economies possible in ing rails when Improved Type "C" MECO LAYERS are used.

THE MECO Rail Layers pick up the rail at abo quarter points, and lower them into place, con by signals from the rear machine. Self-locking and gear hold the load when hoisting power leased. No brakes required.

Let us furnish you complete information on the Improv "C" MECO RAIL LAYERS.

★ **Maintenance Equipment Company**

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

SINCE 1905

America's Leading Railroads

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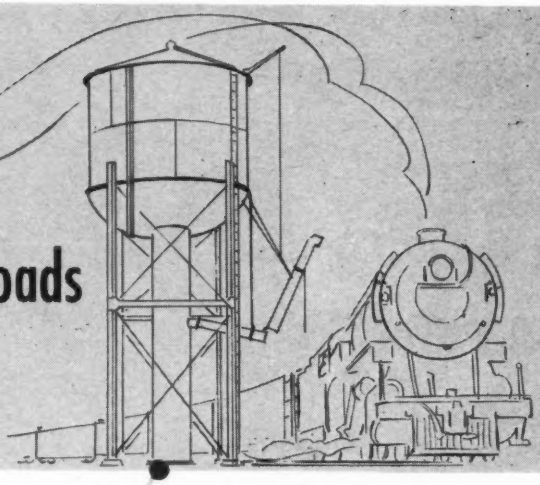

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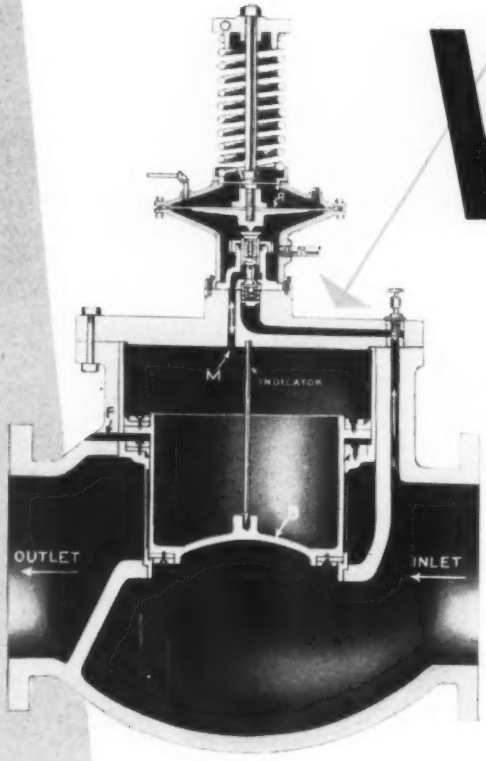
ALTITUDE

VALVES



Golden-Anderson Cushioned Altitude Valves have proven efficiency and performance records on elevated tanks of the main railroads of America. These valves maintain a uniform water level and can additionally be arranged to automatically function pumps, electrical devices or signal lights. The air and water cushioning in all Golden-Anderson valves prevents any shock or hammer and permits valve to operate smoothly at all times. *Write for technical data.*

GOLDEN-ANDERSON *Valve* SPECIALTY CO.

2078 Keenan Building Pittsburgh 22, Pa.

LIFE AND PROPERTY PROTECTION

VALVES SINCE 1905

3 useful air tools for bridge maintenance

Tough jobs of scaling are handled quickly with the CP Triple Scaler. No chisels are required — the pistons act as chisels, hammering old paint, rust or scale without damaging the underlying surface.

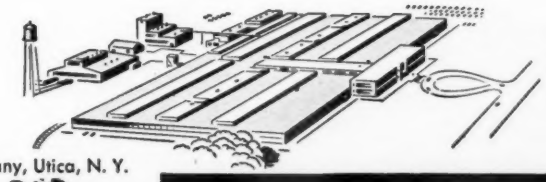
The Triple Scaler weighs only 7¼ pounds, has ½ inch stroke, and operates at 7,000 B.P.M.

For fast, safe nut-running, and the application or removal of bolts, studs or lag screws, and for screw spike driving use the powerful CP-365-RP Reversible Air Impact Wrench. No twisting or kickback, and little vibration, minimizes operator fatigue. The rotary impact action is controllable.

Capacity to 1¼" bolt size; over-all length 16¾"; weight 32 pounds.

For further information send for a copy of SP-3008, Pneumatic Scaling Tools.

Loose scale is rapidly removed from any metal surface with CP Wire Brush Machines. Models, with either straight or pistol grip handles, are available with a wide choice of radial and cup wire brushes. Operating speeds range from 4,200 to 9,000 R.P.M.



With its half million square feet of floor space, Chicago Pneumatic's new Utica unit is the world's most modern plant for the production of pneumatic and electric tools.

Chicago Pneumatic Tool Company, Utica, N. Y.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

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BEALL Hi-Duty SPRING WASHERS are made especially to stand the strain of the heavy-duty rail service required by today's high-speed freight and passenger trains.

These washers are strong and tough, yet provide the necessary "springing action" required at rail joints, frogs and crossings.

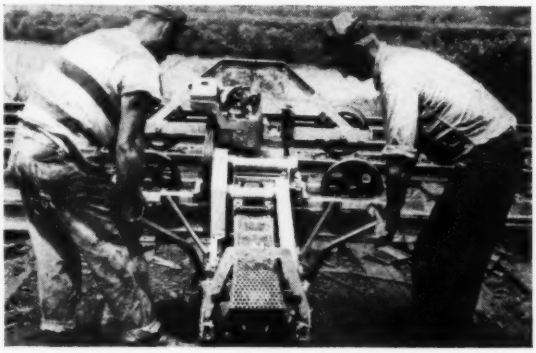
We control every step of their manufacture—from the specification of the specially-developed formula and process used in making the steel to the forming, hardening, tempering and testing operations.

BEALL TOOL DIVISION *of Hubbard & Co.*
EAST ALTON, ILL.

Specialist Manufacturers of Spring Washers

BEALL Hi-Duty
SPRING WASHERS
MADE ESPECIALLY FOR RAILROAD SERVICE

A BETTER *way to* *CLEAN CRIBS . . .*



NEW RTW P-46 BALLAST EXTRUDER

For lowering ballast in cribs before adzing ties, this new RTW machine embodies design and operating features that help speed rail replacement jobs and keep down costs. Rugged teeth mounted on an engine-driven endless chain speedily remove ballast to intertrack spaces or to shoulders without damaging ties. Cribs are cleaned to a uniform level, thus avoiding formation of water pockets.

Simple, compact design makes the RTW P-46 Extruder easy to move along track to and from location. A counterbalancing feature minimizes effort required by operator to raise and lower operating head while machine is in use.

Be sure to call or write immediately for full description and prices on this time- and cost-saving unit.

Railway Trackwork Co.
3207 KENSINGTON AVE., PHILADELHIA 34, PA.

Distributors for

Burro Cranes
Dapco Sprayers
LeRoi Air Compressors
McCulloch Chain Saws
THOR Electric Tools
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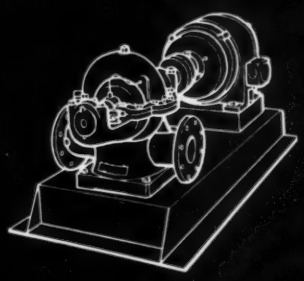
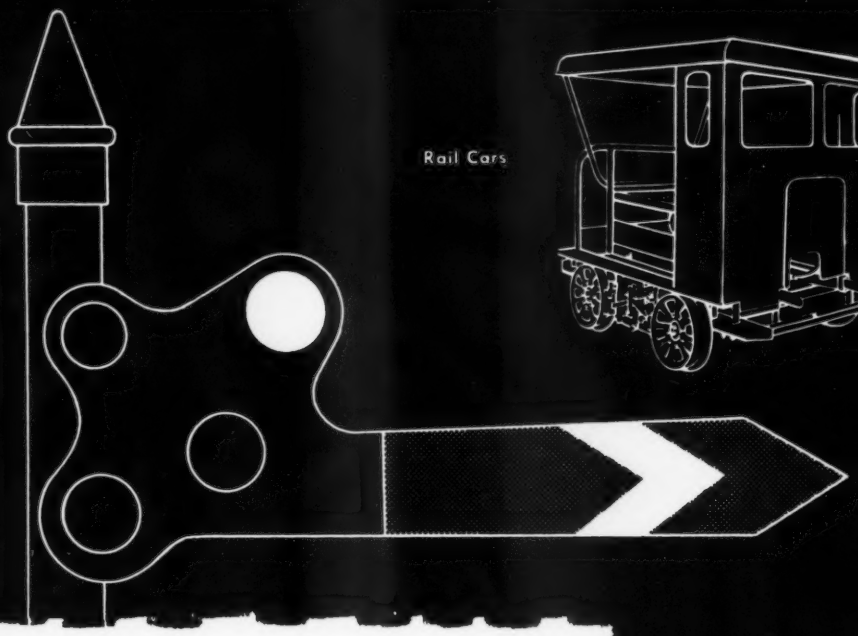
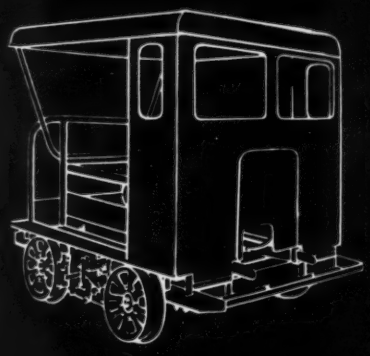
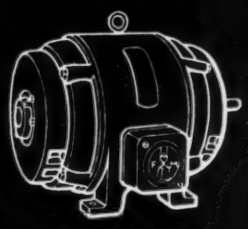


Centrifugal Pumps



Rail Cars





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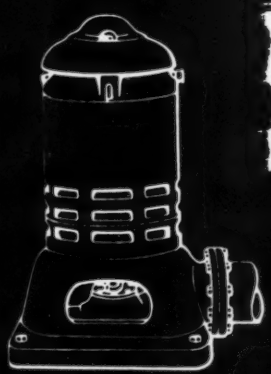
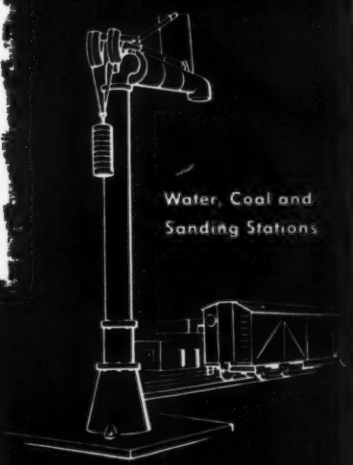


Turbine Pumps



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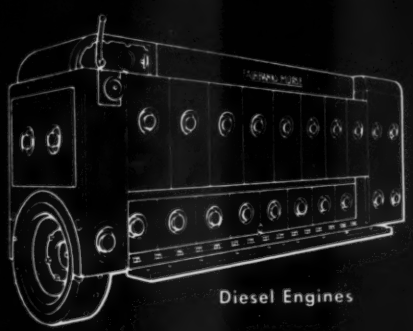
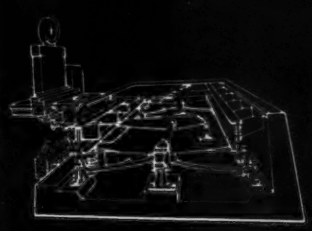
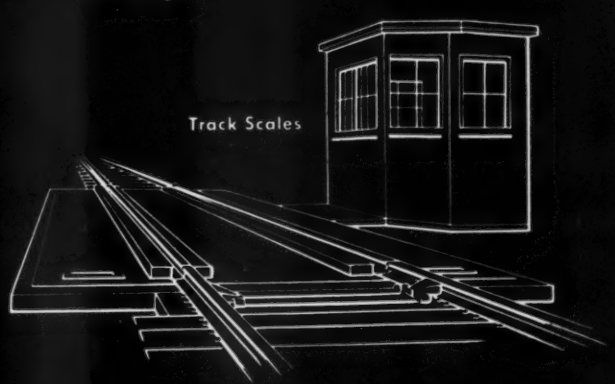
Sanding Stations



Diesel Engines



Truck Scales



Track Scales

No. 260 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: No Effort Spared

Dear Readers:

August 1, 1950

I thought you might be interested in some statistics regarding the amount of work and preparation involved in writing one of the articles in this issue. I refer to the article entitled "The Tie Pad—Story of a Rapid Development," which begins on page 729.

The editor who wrote this article was aware that he had put considerable time and effort into its preparation, but he gave no great amount of thought to the matter until his attention was called to the substantial thickness of the file that had been accumulated while gathering material for it. His curiosity aroused, he made an analysis of the contents of the folder. Among other things, he found that it contained 56 letters, 34 of which, aggregating about 5,700 words, he had written himself, while 22, containing approximately 3,100 words, had been written by others in answer to his inquiries.

Pursuing the investigation further the editor recalled that, while gathering material for the article, he had had personal interviews with five railroad and supply men and that each of these conversations had lasted from 15 min. to 3 hr. Based on these conversations he had dictated notes, for use later, which aggregated nearly 1,000 words. In addition, he had spent several hours reading all available material relating to tie pads.

All this preparatory work took place over a period of about a month preceding the writing of the article. As a result the editor said that he had become so thoroughly saturated with the subject that the actual work of writing the article seemed relatively easy, being started and completed on the same day.

I have a point in mind in citing these facts. The point is that neither time nor effort is spared in our endeavor to give you the most authoritative articles of which our staff is capable. Backed by such effort the preparation of authentic articles is assured because each member of our staff is technically trained and has had years of practical experience in railway maintenance work. Obviously, some articles don't require the amount of effort that went into the one on tie pads, but where such effort is required in the interest of obtaining a quality product, it is unstintingly given.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

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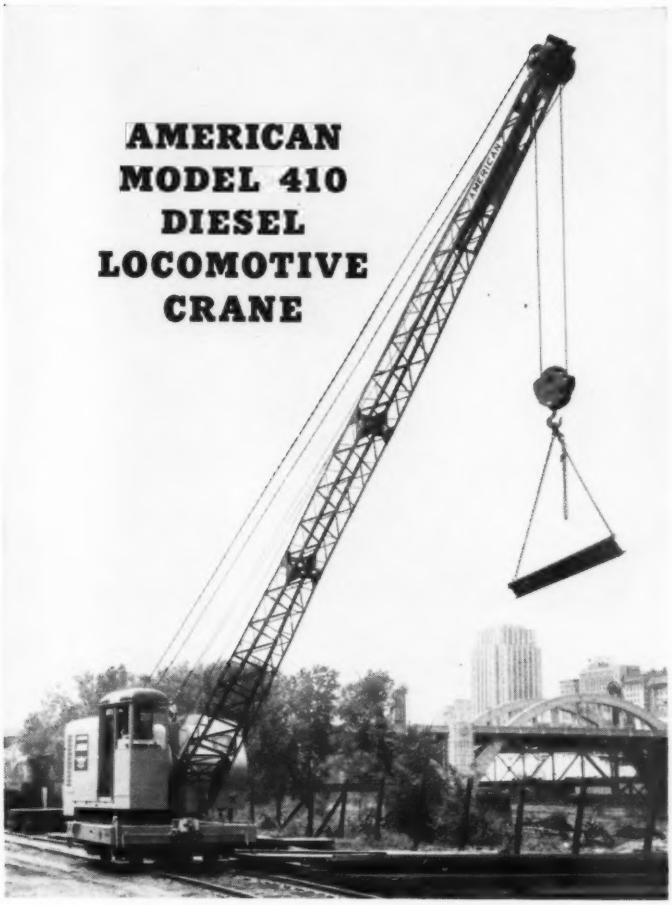

Works one hour on one gallon of fuel!

"Busiest piece of equipment we own..."

"Busiest piece of equipment we own" . . . "Never knew we had so many jobs for it to do" . . . "Gets around like a jack-rabbit" . . . "Ours is booked up for weeks ahead" . . .

That's the kind of talk you hear about the brilliant new American Model 410. Rated at 10 tons capacity, it's amazingly versatile and capable. Works on light track or bumpy track —anywhere. Shows its speed, its smoothness, its flexibility equally well with bucket, hook or magnet.

Want a crane that will almost never stand idle? One that works for a dollar-a-day fuel ration? One that cuts maintenance costs to the vanishing point? Mail the coupon below for literature!

BUCKET WORK shows off the Model 410's superb operating smoothness . . . fast swinging . . . quick action boom hoist. It moves coal, cinders, gravel, other materials . . . *fast.*

MAGNET WORK is making the 410 famous as one of the greatest scrap-handlers of all time. American push-button control provides over-excitation of magnet.

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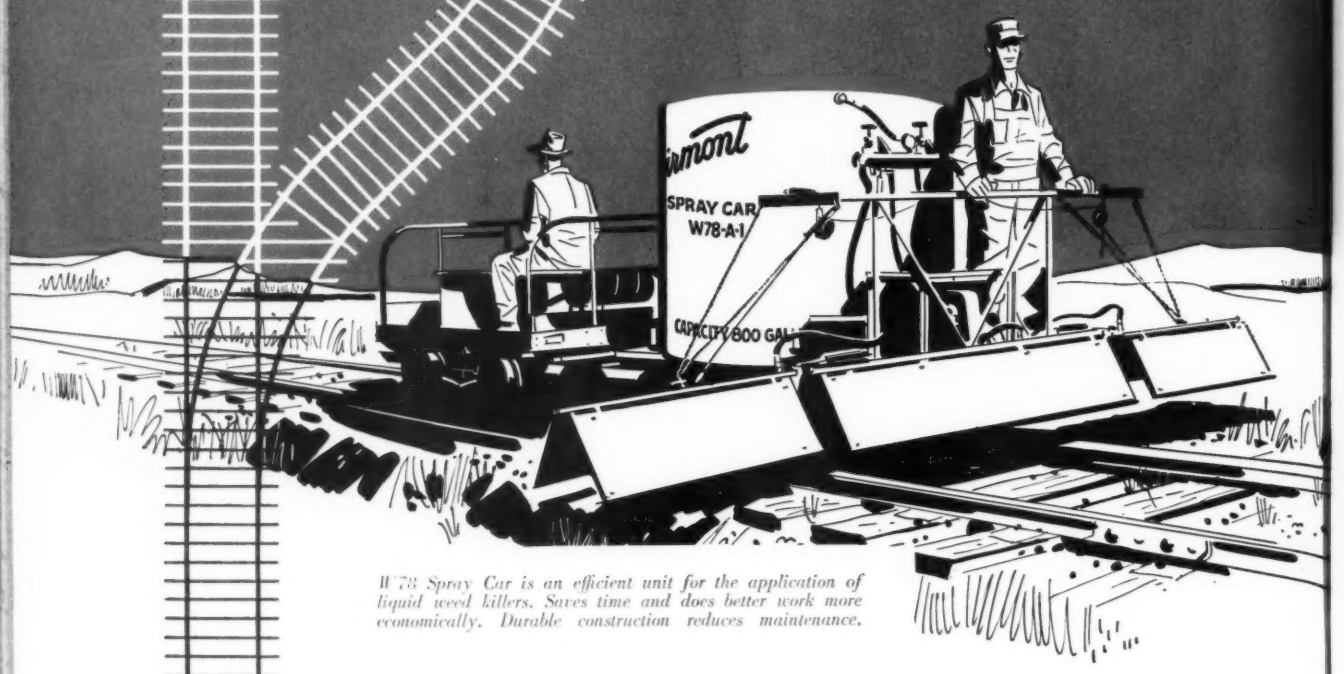
. . . it isn't just the train that moves faster



W 78 Spray Car is an efficient unit for the application of liquid weed killers. Saves time and does better work more economically. Durable construction reduces maintenance.

The contrast of the slow, plodding pace with which the early coal-burning trains labored their way from town to town and the amazing speeds in which modern diesel locomotives now span entire continents, is dramatic evidence of the railroad progress of the past half-century.

But with the improvements of the trains themselves, every phase of railroad operation has quickened its pace. Rail maintenance, once a task that challenged the very strength of man, has now been made even easier by machines and tools.

For every maintenance job—weed control, ballast drainage, tie renewals, etc.—research and invention have produced equipment that speeds the work many, many times over.

We of Fairmont are proud to have shared in the rapid growth and development of such a vital phase of today's railway operations—as we are proud that every Fairmont product is the latest expression of the *continuing* effort to find better, faster and even more efficient and economical ways of maintaining the nation's roadbeds.

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WHAT HAPPENED to a Railroad Tie WITHOUT any Tie Pad

This creosoted hardwood tie was installed on a main line curve on a grade without a pad beneath the tie plate. The photograph is of the inner end of the tie and shows plate cutting of .56 in. after 8 years of service.

-and WITH a Resilient Tie Pad

This creosoted hard wood tie was installed near the one above, with one of our resilient tie pads made of cotton and rubber used beneath the plate. The Photograph is of the inner end of the tie. Plate cutting amounted to only .06 in., a reduction in wear, from the tie shown above, of 89%, after 8 years of service.

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WRITE US TODAY

Rail Facilities —

Our Trump Card in the World Situation

Whether the war in Korea will remain localized or eventually will prove to be the opening engagement of World War III is a question that cannot be answered at this time, at least not at the time of going to press. But there is a growing feeling among thinking people that the plan of the communists for world conquest is now being put into action and that it is only a matter of time until the resources of the United States must be fully committed in an effort to thwart this plan.

In this struggle the aggressor, as is nearly always the case, will win early successes. The initial advantage will be his because he will be working in accordance with a definite plan calling for military action at various points, for which he has been able, at his leisure, to accumulate the necessary materials of war in the areas where he *knew* they would be needed. But as the conflict drags on, and the long-accumulated stockpiles are consumed, other factors will begin to make themselves felt—factors that conceivably will have an important bearing in determining the final outcome.

One of these factors is the relative efficiency and capacity of the internal transportation systems of the two sides. As the scenes of major action shift from place to place around the world, the advantage will be with the side that has the best facilities for moving great masses of men and materials long distances. Rail transport systems will play a major role in this phase of the conflict, and it is here that the United States will have a tremendous advantage. Compared with the 237,000 mi. of railway lines within the borders of our country, Russia has only 66,000 mi. As against seven routes spanning this country from east to west there is only a single double-track line linking European Russia with Siberia.

There is more than an academic interest in these figures for the readers of this magazine. They will have the responsibility of making certain that the edge we have in rail transport facilities will not be narrowed by any deterioration of the tracks and other essential parts of the fixed plant. They must expect a return of priorities, but they must be prepared to fight for what they consider necessary to the integrity of the properties under their supervision. Even so, there will be severe shortages of materials that must be countered by the highest ingenuity in using them. At the same time it can be expected that, as during the last war, there will be a substantial uptrend in railway traffic, a development that will add to the problems of the maintenance man.

This is not a cheerful picture, recalling as it does, all the hardships and problems of World War II, but nothing can be gained by ignoring what appear to be the facts of the situation or by minimizing its seriousness. Although there isn't much of a tangible nature that individuals can do about the situation at the present time, there is a certain value in having a realistic view of the potentialities. It then becomes possible to appraise each new development with a cool-headed objectiveness, assuring that correct decisions will be made and the most effective action taken.

TWO CONVENTIONS —

Not Too Early to Make Your Plans

IN THE third week of next month, railroad supervisory officers who are responsible for the maintenance and construction of railway tracks, bridges, buildings and water-service facilities, will be gathering from all over the United States and Canada at Chicago's Stevens hotel for the concurrent conventions of two of the oldest railway associations—the Roadmasters' and Maintenance of Way Association and the American Railway Bridge & Building Association.

Year after year, the members of these two groups have formed committees to investigate and report on current problems and trends. When each report has been read to the convention by the committee chairman, the subject is thrown open for discussion from the floor. Here is it that those attending the meeting gain the most from their association work. They ask questions freely concerning their own difficulties, and, out of their own experiences, they contribute information of value to others. Here it is, too, that a member learns that his contemporaries are beset by the same problems with which he is coping. From these discussions many a member gains a fresh viewpoint regarding one or more of the problems facing him.

The seriousness which these men apply themselves to the work of the two associations must certainly be heartening to their superior officers, because it is inconceivable that any man can attend these meetings and not go home with a much better understanding of his work and responsibilities. All members are encouraged, even urged, to take an active part in the preparation of the reports and in the discussions. Unlike some associations, the Roadmasters' and the B. & B. associations welcome interested railway men at their meetings who are not members of these bodies and even extend to them the privilege of joining in the discussions.

In addition to the reports of the technical committees, the programs of the coming conventions will include addresses by notable railway officers who will bring inspiring messages to the members of both associations in joint meetings. Furthermore, the programs will be arranged so as to allow the members ample time in which to view an exhibit of manufacturers' products, to be staged at the Coliseum by the Track Supply Association and the Bridge and Building Supply Men's Association. This will be a record assembly of machines, devices and materials of interest to the members of the two railway groups, and will include many new products not heretofore exhibited.

The two conventions, coupled with the exhibit, provide a combination of activities that will make attendance a "must" for every maintenance supervisory officer who can possibly arrange to be there. Many such officers will find it difficult to get away from their territories unless definite plans are made in advance. It is not too early to make such plans. And those supervisory officers who are not members of either of the two associations, should, while pondering the matter of attending the meetings, be giving serious consideration to identifying themselves more closely with one or the other of these worthy groups.

"STRUCK BY TRAIN" —

A Frequent but Unnecessary Epitaph

A VIVID safety story in a railway employee magazine recently brought to mind the seeming inconsistency with which some men evaluate their chances of surviving known dangers.

Under the title, "A Train Strikes with Deady Force", this article drew a dramatic picture of 27 men killed and 32 injured in the last 10 years by being struck by engines or cars while at work. It pointed out that "if an engine or car should strike a man, his chances of survival are about 50-50". Continuing, the article told the story of a carpenter who lost his life because he did not comply with a safety rule which read, ". . . men should not work or stand on one track when trains are passing on another."

Not only had the dead man known that rule—and, presumably, generally obeyed it—but he, along with his fellow workers, had been given, in other magazine stories and in accident bulletins, the details of the manner in which the previous 26 men had been killed. Thus, with the danger known, why did he continue to work as he did? Did he feel that he was lucky enough to be among the 50 percent who might survive being hit by a locomotive or was he just careless? Is it possible that many employees feel that they are luckier than the other fellow and can survive such wanton chance taking?

This may seem to be a silly question. Yet, if statistics of past performances can be taken as a warning, there will be two men on the railroad mentioned and 130 other railway men throughout the country who will die during 1950 by flaunting fate and taking extremely long-shot "bets" that when they stay on a track in violation of existing safety rules no trains will strike them. That's a bad bet to lose and one that is not much better to win. For if it is won once, a bad habit is started that is likely to result eventually in an accident.

If people bet on their lives, it would seem better to place their wagers regularly on that basic safety rule that "locomotives or cars can be expected to run in any direction, on any track, at any time." All bets placed on that expectation are certain to be won, but epitaphs go to those who bet against it.

THE TIE PAD —

Story of a Rapid Development

The use of pads under tie plates as a means of prolonging the life of wood crossties has gained rapidly in the relatively few years since they were first introduced. The reasons behind this development, the function of the tie pad, its use at special locations, and the secondary benefits attributed to it, are among the phases of the subject discussed in this article.

• The term "tie pad" is relatively new. It was only somewhat more than a decade ago that the first commercial tie pad was placed on the market. Now the use of tie pads at certain locations is an accepted practice on some roads and nearly all major lines have test installations under observation. Ten years ago only one or two manufacturers were interested in the market for tie pads. At the present time, on the other hand, at least nine companies are more or less interested in this market, and several others are known to have tie pads in various stages of development.

What has caused this phenomenal growth of interest in tie pads? The answer to this question lies largely in the increase that has occurred in the cost of a new treated crosstie in place in the track. In 1939 this cost was about $2.25 per tie; today it is approximately $4.50 per tie. The rising cost curve represented by these figures has been paralleled by another curve representing the increasing interest and effort on the part of track maintenance men to effect economies by prolonging the service life of ties.

A cue to the approach required in dealing with the problem was contained in the fact that the majority of crossties were failing because of mechanical damage, such as checking, splitting and the cutting of the wood by the tie plates. It was apparent that the technique of protecting crossties from decay had progressed to the point where the service life of ties could be considerably extended if more effective means could be devised for protecting them from mechanical damage.

What Is Potential Tie Life?

At the present time the life of crossties generally ranges between 20 and 25 years, although at many locations where conditions are particularly severe ties are being taken out of track after only 15 years or so of service. What is the potential service life of ties, assuming that the problem of mechanical damage can be licked? In a recent address, G. M. Magee, research engineer of the Association of American Railroads, presupposing certain advances in treating techniques in conjunction with the elimination of mechanical wear, said "it seems logical to suppose that an average tie life of 35 to 40 years can be obtained in this country." Some estimates of the potential service life are considerably in excess of these figures.

One of the most important phases of the problem of dealing with mechanical damage is that of protecting the wood in the tie-plate area from the cutting action of the tie plate. Several methods have been proposed for accomplishing this end. Larger tie plates, hold-down spikes for fastening the tie plates more tightly to the ties, various coatings applied between the tie plates and the ties, and tie pads—these are all either in actual use in varying degrees or are being given serious consideration. In singling out tie pads for discussion in this article the purpose is to review the progress that has been made in furthering an interesting phase of the battle against mechanical damage—and not to minimize the value of any of the other expedients that are being used or have been proposed.

Since the damage that occurs to ties in the tie-plate area is largely attributable to the impact and vibration of the steel plate in direct contact with the softer wood under it, coupled with other factors incident to this

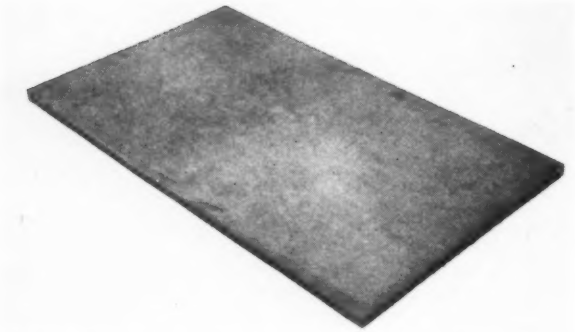
Cutting by tie plates shortens tie life . . .

. . . on curves

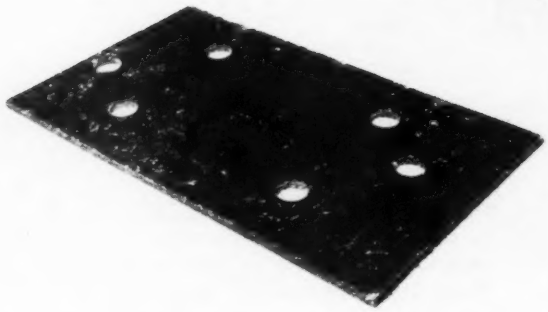
. . . on bridges

. . . through turnouts

. . on tangent track

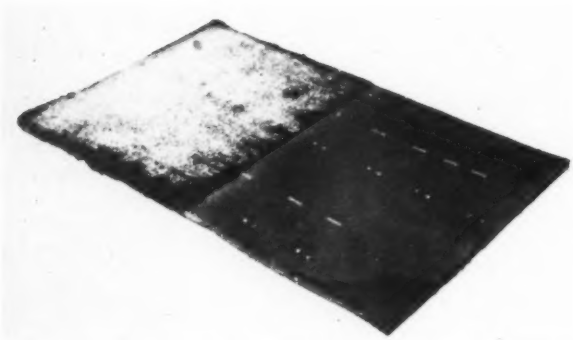


Fabreeka pad—Fabreeka Products Company, Inc., Boston, Mass. Designed for use at points of unusually severe service in track, such as under crossings and crossovers, or on bridges, etc. Pad is composed of layers of cotton duck, each layer impregnated with a special rubber compound. These layers are built up to required thickness and then vulcanized together



Fabco tie pad—Fabreeka Products Company, Inc., Boston, Mass. This pad is made of the same materials—cotton fiber and rubber—as Fabreeka (left), but, instead of being laminated, it is a ground mixture of these materials, molded under heat and pressure to a thickness of ¼ in. Pad can be furnished solid or prepunched to correspond with any specification

Presented on these two pages are photographs of nine different types of tie pads, each accompanied by a brief, factual description

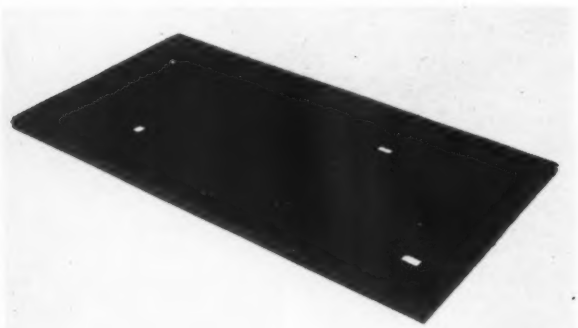


Bird tie pad—Bird & Son, Inc., East Walpole, Mass. Laminated fabric pad with heavy outside coating of asphalt. Outside and alternate plies of heavy cotton duck; intermediate plies of special burlap. All plies saturated with waterproofing and mildew-proofing materials, laminated, under pressure, with a modified asphalt, and stitched with solid bronze staples

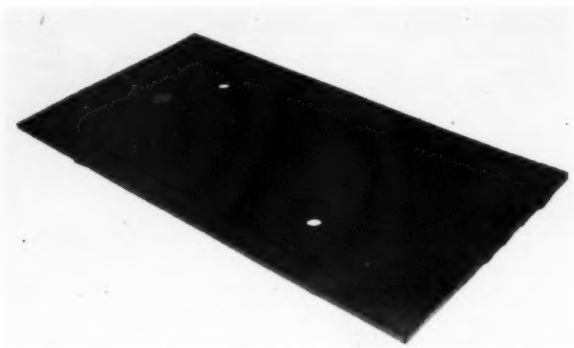
contact, the introduction of a pad of resilient material between the plate and the tie to absorb the punishment appeared to offer excellent possibilities. The first commercial tie pads were developed and placed under test about the middle 'thirties. Since then, as the need for getting more life from ties became more urgent due to increasing costs of material and labor, additional pads have been developed. A variety of materials and methods of manufacture are represented by the different pads on the market or under test. Appearing with this article are photographs of all the known types of pads, each accompanied by a brief factual description.

Their Use on Bridges

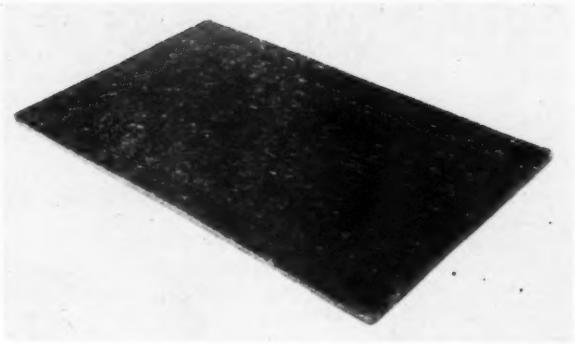
Tie pads first received consideration as a means of protecting ties at locations of unusually severe wear or where other conditions made it especially desirable to get the maximum life from ties. The potential savings through the use of tie pads on bridges are considered particularly attractive. The primary consideration here seems to be the greater cost of such ties as compared with track ties, and the greater difficulty and expense involved in renewing them. Various roads have made test installations of tie pads on bridges, and on a number of lines the protection of bridge ties in this manner has passed beyond the experimental stage. An out-



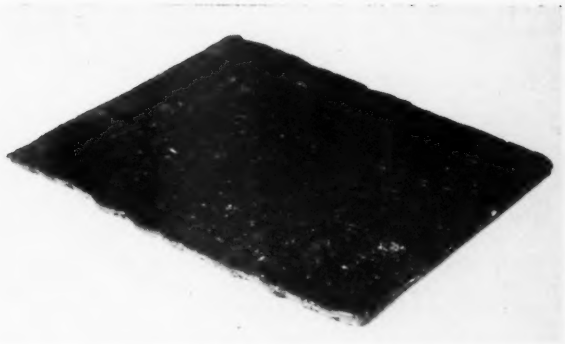
Rubber tie pad—Railroad Rubber Products, Inc., Ashtabula, Ohio. Made of all rubber with a high modulus of elasticity. Can be furnished in two different types. One, with a thickness of 3/16 in. to ¼ in., is designed solely for reduction of tie wear. The other, ⅜ in. to ½ in. thick, is designed to provide a uniform deflection of ⅛ in. under maximum wheel loads



Rubber tie pad—The Dunne Rubber Company, Ashtabula, Ohio. Pad is ⅛ in. thick and is made from a rubber stock similar to that used in tire treads. Reinforcing agents and anti-oxidents are used. Both the top and bottom of the tie pad are grooved, the top grooves running parallel with, and the bottom grooves at right angles to, the long dimension of the pad



Burkart tie pad—F. Burkart Manufacturing Company, St. Louis, Mo. Made of structural vegetable fibre which is loomed and needled into a dense mat, impregnated with a formulation of vinyl resins as a binder, and cured and compressed to a thin (about 3/16 in.) pad. In most applications spike holes are not prepunched. The spikes are driven through the solid pad



Tie-Saver track pad—Achuff Railway Supply Company, St. Louis, Mo. Consists of a fibre body impregnated with a special, slightly-resilient rubber compound, and formed under pressure to a finished thickness, for ordinary purposes, of 3/16 in. The pad may be installed without prepunching, but, if desired, it can be furnished prepunched to any specifications

standing example of this application is a project, now under way, for installing tie pads on the Huey Long bridge which spans the Mississippi river at New Orleans.

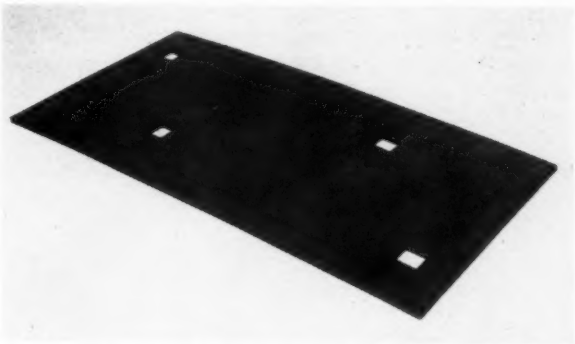
Because of the tendency of tie plates on curved track to cut into the ties at a faster rate than on tangent track the possible savings to be realized through the use of tie pads on curves have received careful consideration. Many roads have test installations of tie pads on curves, and not a few top maintenance officers are now convinced that the savings possible at such locations are more than sufficient to justify the cost of the pads. At least one road is now conducting tests to determine the curvature range within which the use of tie pads is justifiable. The chief engineer of this road is of the opinion that tie pads may be justified on main-line curves as low as two degrees, and says there is no question but that they should be used on curves of four degrees and over. The practice on this road is to install the pads on curves when the rails are transposed or when new rail is laid.

Other Special Locations

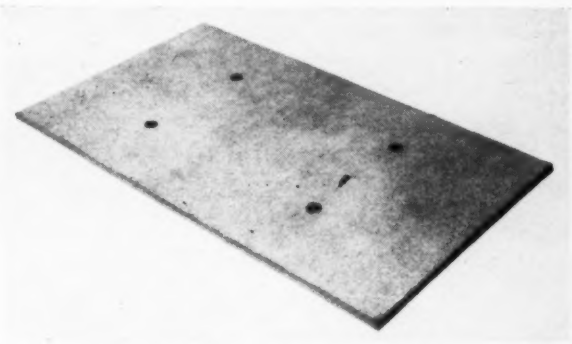
The use of tie pads at various other special locations is also under consideration, and in some instances more or less extensive test installations have been made. High-speed turnouts, where the punishment taken by the ties is severe and where the cost of renewal is high, comprise one of these special locations. Another is presented by stretches of track in sandy territories where the wear of the ties is accelerated by the abrasive action of sand that gets underneath the tie plates. Heavily-traveled tracks and turnouts in yards and terminals are other locations where tie pads are being installed to prevent the rapid cutting of the ties that would otherwise take place. Other special locations where pads have been used to good advantage include crossings, turntables, track scales, insulated joints, and at water tanks.

A rather unusual application of tie pads made by one road is at a number of highway crossings where heavy truck traffic is carried by the highways. At these locations the cutting of the ties by the tie plates had been occurring at about twice the rate as in adjoining stretches of track, and the pads were installed to determine their effectiveness in overcoming this difficulty.

A theory that is gaining acceptance with the deterioration of crossties in the tie-plate area is that the presence of moisture, sand and other foreign matter between the tie plates and the ties leads to chemical changes in the wood that cause it to break down prematurely. This theory holds that tie pads not only protect the tie from the mechanical action of the tie



Rubber-Fibre tie pad—The Taylor Fibre Company, Norristown, Pa. Pad consists of a layer of special rubber sandwiched between two layers of vulcanized fibre. These materials are bonded together by a special process involving extremely high pressure. This type of pad is still in the development stage and is undergoing service tests on a number of roads



Felt tie pad—The Western Felt Works, Chicago. Consists of a blend of wool fibres impregnated with a special solution designed to increase resistance to water, mildew and fungi. The fibres are interlocked and formed into a pad by special mechanical operations. The pad shown is 7⅜ in wide, 13 in. long and ¼ in. thick, and is prepunched with ⅜ in. holes

plates but also, by sealing out foreign matter, thwart the softening of the wood by these chemical processes.

Effect on Surface, Gage

Another theory that is gaining credence among maintenance men is that the use of tie pads produces secondary benefits entirely aside from their function in protecting the ties from mechanical damage. One aspect of this theory is that the pads cause a modification of the impacts of traffic—in other words, a cushioning effect—which reduces the tendency of the ties to be pressed down into the ballast. If true, this would mean that track incorporating tie pads would have a reduced tendency to get out of surface—with a consequent saving in the cost of surfacing it. Some evidence is available to substantiate this theory, including the results of test installations of tie pads at a number of insulated joints that had previously given trouble in the form of pumping of the ties. Following the installation of the pads it was reported that conditions were greatly improved.

On curves the cutting action of tie plates generally occurs at a more rapid rate at the field ends of the tie plates than at the gage ends, resulting in widening of the gage. Thus, another secondary but important benefit claimed to result from the use of tie pads is a reduction in the amount of regaging and readzing required on curves.Also, it is reported that some early evidence is beginning to develop that tie pads may have some effect in postponing the appearance of rail-end batter. While some of these secondary benefits must be regarded as intangibles they are, never-theless, worthy of consideration when the economic value of tie pads, for installation at special locations or as a general practice, is being weighed.

The extent to which tie life is prolonged by the use of tie pads depends, of course, on various factors including the length of time the pads retain their effectiveness. While it will be at least several years before definite conclusions can be drawn from the many test installations now under observations, some tests have been in service long enough to demonstrate that, assuming the pads remain effective, they do prevent further cutting of the ties.

A.A.R. Test Is Broadest

Probably the most extensive single test installation of tie pads that has been made, measured by the number of types of pads under observation, is the service test that has been installed on the Louisville & Nashville near London, Ky., by the research staff of the Association of American Railroads under the sponsorship of the Track committee of the American Railway Engineering Association. This test is being made for the purpose of determining the relative effectiveness of various means of preventing tie-plate wear of the ties, including hold-down fastenings and coatings as well as pads.

This test provides a measure of the rapid development of tie pads that has occurred in recent years. When the test track was first established in 1947, only two types of track pads were installed. In the following year one additional type was placed under observation, and in 1949 two more types were added. In July of this year four more types, none of which had previously been installed, were placed under observation.

In reporting on this test at the 1950 annual convention of the A.R.E.A. the Track committee said that it had been "of insufficient duration to warrant conclusions regarding the relative expected service life, effectiveness in minimizing tie abrasion and overall economy of the several types of tie pads." However, it offered the following comments:

1. Tie pads should be made of durable material capable of withstanding the elements and service conditions for many years.
2. Their mechanical strength must be sufficient to avoid pulling apart and working out, separation of the plies, ripping at the spikes and an unequal compression at the ends of the tie plate to such an extent as to cause an appreciable canting of the rail outward on curves and widen the gage of track.
3. Pads should be sealed to the ties with an inexpensive material to avoid movement on the ties and to keep out water, sand, dirt, etc.
4. Pads should be made of a material of sufficient strength to resist the bearing pressures but not hard enough to abrade the tie.
5. Pad thickness should be held to the minimum so that the spikes will not crush the wood fibers laterally and cause wide gage, particularly on curves.

In evaluating the economic worth of tie pads their cost must be considered in relationship to the additional service life obtained from the crossties so protected, and the other benefits that may be expected. Obviously, the savings, as with the preservative treatment of ties, will be realized over a period of years. On the other hand, if it should develop that the use of tie pads will make it possible to employ smaller tie plates, it is not unlikely that an immediate savings would be realized.

View of test track on the L. & N., near London, Ky., where research staff of the A.A.R. is observing relative effectiveness of various means of preventing tie-plate wear of ties, including hold-down fastenings and coatings as well as pads

Cues for Improving M/W Operations

By T. E. MacMANNIS
Engineer Maintenance of Way
Jersey Central Lines, Jersey City, N. J.

A stretch of main track on the Jersey Central laid with 78-ft. rails made by pressure welding two 39-ft. lengths

This article is abstracted from a paper read by Mr. MacMannis at a recent meeting of the Metropolitan Maintenance of Way Club of New York. In it he dwells on types of work where costs might be reduced effectively if some careful thinking were applied before the operations are begun.

• The primary obligation of the Maintenance of Way department is to maintain a satisfactory railroad at minimum expense. Achievement of this goal has become more difficult with the advent of the 40-hour week and with the tendency of labor organizations to wrap up various types of work into small packages which can be performed only by certain classes of employees. Also we must realize that railroads are getting less and less of the transportation business, particularly of the cream of the business. This means that funds for maintenance of way work may be less than that to which we have been accustomed and may be much less if it is necessary to restrict the ratio of maintenance-of-way expenses to income. It is our obligation to be sure that these funds are used to the best advantage, getting a dollar's worth of value for each dollar spent.

It is of prime importance that we recognize our opportunities and be prepared to take full advantage of them. As an aid in this respect, let us review some of the opportunities we, as M. of W. men, have.

Intra- and Inter-Department Cooperation and Coordination—Too often the individual interests of either the track, structures or signal department are considered by the individual group without regard to the other groups who may be affected. Too frequently the track supervisor has his own plans completely upset when he is required to provide men, material, equipment and work service on extremely short notice to assist other departments in carrying out their work. This procedure is costly and is discouraging because it should be the responsibility of the division engineer to coordinate the activities in his department so that all sub-departments function effectively. How can a track supervisor plan and carry out his work satisfactorily when he must "adjust" his plans suddenly to help another—the master carpenter, perhaps—who failed to give him advance notice of the nature and extent of the assistance needed? Emergency work, of course, does not fall into this catagory.

Better Training and Control of Work—I well recall the advice given me some 25 years ago when I was starting my career, as a track supervisor. The boss said I should watch what certain foremen did, find out why and how, and then have other foremen do the same thing. In those days we had at least some foremen who took pride in maintaining their sections better than other foremen did. These men had the sense of responsibility that is properly theirs and particularly the knack of knowing where and how to spend their efforts to do the most good. Undoubtedly, some of these men are still in service but they are few in number. It is not important that we go into the reasons for this change, but it is important that our supervisory officers in our department sense the change and know what to do about it.

The answer to this problem lies in the training and control of foremen and men. An article in Railway Age following the last Roadmasters' Convention was impressive because it emphasized many things that supervisors need do to handle their work properly. Even though it may be repetitious it is worth while to mention the topics cited in that article. The following list is not necessarily in order of importance.

(a) The good-housekeeping habit.
(b) Proper ballast distribution.
(c) Abuse of tools and equipment.
(d) Supervision of track gangs:
    1. Training and education by supervisors.
    2. Organization of men.
    3. Get maximum productive work.
    4. Coordination when several gangs work together.
(e) Know that equipment is in proper working order.
(f) Supply proper tools.
(g) Handle discipline properly.

. . . Fortunately our friends in the supply business will help us in every possible way to solve our problems. We are all grateful for their efforts in recent years to provide us with improved materials and equipment. The prospect for more and better materials and equipment is excellent and I am sure we are all thankful. . . .

(h) Enforce safety rules and practices.
(i) Know your foremen and their shortcomings.
(j) Line up work in advance.
(k) Check to see if work is done properly.

Maintenance vs. Reconditioning —It is said, "A stitch in time saves nine," and I thoroughly believe in that saying. Too frequently, emphasis is placed on the completion of so-called programmed work to the detriment of the overall condition of the railroad. This situation may be the result of top management's demanding completion of programs for which money and men have been provided as requested. More particularly, I believe it is due to some maintenance officers believing they will get more credit for completing a program rather than for keeping their whole railroad in generally good condition. Usually it is uneconomical to defer or avoid repairs that need only a "stitch" in order to make an entirely new garment. Here is a very good opportunity to improve M. of W. operations.

Improved Labor Relations – I mentioned earlier that the labor organizations were making it more difficult for maintenance officers to carry out their obligations. This is so, but it is not my intention to advocate unthinking resistance to their demands, but rather to concur in any reasonable demand that promises to give us more or better work at fair costs. This infers good wage rates and working conditions for men who are qualified in every way to do the jobs we have for them. On the other hand, we should resist the tendency to have seniority interpreted as meaning that only a limited amount of certain types of work can be done by employees in restricted groups or classes.

New Methods – It is essential that we be alert to develop or detect new methods for doing our work. In our business we can't accept the saying that "You can't teach old dogs new tricks." Fortunately, our supply friends will not let "sleeping dogs lie" and are constantly coming forward with new tools and equipment that will help some if not all of us. The committees of the several engineering and M. of W. organizations are regularly reporting as to new and better methods for doing work.

Organization – The efficiency of an organization is proven by the results obtained. To obtain satisfactory results the organization must be basically good from top to bottom. All of you probably know there is a tendency at this time to change the old section gang set-up that has functioned successfully ever since railroads began. However, for some years and for various reasons, on some roads at least, the section gang has not functioned as of old but has been merely an adjunct of a special force designed to do practically all of the construction work in a given territory. It is obvious that a small section force with an individual foreman is not the economical way for handling jobs needing many men. Further, the materials and methods in vogue for some time have produced tracks and roadway that are far more substantial than those which existed years ago. These tracks do not need attention every day as in the past.

Moreover, there has been a tendency in some districts for foremen to shift from section to section, so that the old "personal touch" is never acquired. The lack of this "touch" is highly detrimental to the section gang type of organization. At least one major road in the east abandoned the section gang organization years ago and so far as I know has benefited by it. Recently other roads have modified the section gang organization and just recently the Jersey Central eliminated eight section gangs in a portion of the commuting territory and replaced this force with three small "light maintenance gangs," two "heavy maintenance gangs," and two "track inspectors."

The primary difference between the new Jersey Central organization and the new set-ups on other roads is that the foremen of both classes of maintenance gangs are relieved of all responsibility for inspections and this responsibility is placed solely with the track inspectors. We will know more of the efficiency of this type organization after we have lived with it for a time.

Greater Utilization of Trackage Given Up for M. of W. Use – Some of us are fortunate enough to be working on roads whose operating people realize the advantage of giving up a track solely to permit M. & W. work to be done. Yet this imposes an obligation which we must accept – to take full advantage of time given us. This requires excellent planning and a full review of methods and organizations. It requires cooperation on the part of other departments beside the operating people to be sure that men, materials, and equipment, and any assistance that is needed are available at the proper time and place exactly when needed.

Improved Methods for Reconditioning Track Under Traffic – The loss of effective working time when reconditioning tracks under traffic is one of the primary reasons for track maintenance costs being so high. Not only is there loss of time in clearing for trains but the restricted manner in which the work must be progressed, because the track must be kept safe for service as needed, imposes a handicap that results in possibly only a two-thirds performance, compared with similar work done with the track out of service.

It seems to me that more trackage could be taken out of service for reconditioning than is generally done. I know that one of our neighboring roads utilizes temporary crossovers to good effect for this purpose. This may be an opportunity that we have not recog-

. . . The personality of the supervisor has a great effect on what is accomplished by his men. His knowledge of requirements, methods, etc., is basic and he must understand human nature. He must be fair and reasonable, but firm in his demands. Even though some may differ with me, I believe that more can be accomplished by reasoning and cooperating with men than by driving them. . . .

nized. On the other hand some trackage definitely cannot be taken out of service even for reconditioning and it is essential that, at such locations, improved methods be developed to do the work more efficiently. I am impressed with the possibility that the use of machines now available or being developed for the removal and installation of ties will improve this particular operation.

Work-Train Operations – The high cost of work train service should be appreciated by every M. of W. officer for I suspect that most work trains are lucky if they work 60 per cent of the time they are on the road. Furthermore, the problem is getting decidely worse in view of the Dieselization program in effect on most roads. The Diesel programs have eliminated some old steam engine terminals that used to be near work train headquarters and now the Diesel engines must be moved long distances to reach the work train siding. Yet the expense is charged to the M. of W. department. The effect of the 40-hour week in the M. of W. department on work service operations is not yet clear but it appears that we may have to operate trains on Saturdays to satisfy some organizations. This will not be good for those of us who have a limited, if any, track force on duty on Saturdays.

At any rate, it is an opportunity for us to find satisfactory substitutes for work service to the maximum practical extent. The use of auto trucks has helped greatly and the development of machines designed for high production, such as the Jordan Spreader and the various type ballast cleaning machines, has reduced work train requirements.

Drainage – This is a subject on which there should be no dispute and yet it is something which provokes more argument than almost any other phase of M. & W. work. All roadbeds must have adequate drainage to be at all satisfactory. The real question is what needs to be done and how to do it. Some roads have gone in very extensively for deep ditching and that may have been the proper solution for them. Certainly adequate drainage can be provided in most cases merely by shallow ditches that can be cleaned cheaply by power equipment such as the Jordan Spreader. The thing that disturbs me is the situation where the subgrade is underlaid with materials that puddle and pump to the surface when any water reaches it by seeping through the ballast and subgrade materials or working up through the underlaid material. The latter circumstance might be overcome by grouting or some similar process but I have yet to learn how to avoid the trouble when it results from seepage through the ballast. Here is another opportunity for us to use our wits and find a solution.

Ballast – This is a subject of which too little is known and for this reason there is an opportunity to do something better. The Diesel locomotive is making it imperative to find a substitute for cinder ballast and in many locations it is quite a problem to find any kind of material considered suitable, without paying an exorbitant price for freight if not for the substitute ballast itself. The size of stone ballast used by some of us is at least questionable and the method of renovating and salvaging it is at least doubtful. It is true that many types of acceptable machines are available for cleaning the center ditch, shoulders and even the cribs, but so far as I am concerned the method for handling the ballast in cribs is not suitable on multiple-track territory.

Ties – There is no greater opportunity to improve M. of W. operations than by extending the life of ties. I have been impressed by the possibility of restricting splitting by the quick drying and treating process advanced by one wood preserving company. The improved use of anti-splitting devices and of pads are worthy of real consideration. The handling of the ties by the track forces to prevent damage and the use of fittings and practices to prevent spike killing or excessive mechanical wear and the subsequent effect of weathering are things each supervisor should follow up.

Rail – There is a real opportunity to effect savings by determining the economical section and length of rail required, and it is our obligation to insist on a change as soon as possible. This is a subject that is controversial but nevertheless one that must be solved, perhaps for each road individually. It is something about which all of us need to seek information from every available source so that our managements may be intelligently advised by recommendations for changes. To emphasize this point I will tell you that until recently I was "sold" on the 132-lb. rail section but fortunately I had the advantage of advice from two other sources that convinced me the 140-lb. rail section is much superior for our needs. As to rail lengths I refer you to Cliff Bronson's treatise in the April issue of ***Railway Engineering and Maintenance***. So far as I am concerned there is every reason to use rails longer than 39 ft. They can readily be handled and the economy is unquestioned. It seems to me that continuous welded rail is essential in special locations such as tunnels, covered platforms, and at locations in open track where joint maintenance is excessive.

The gist of this discourse has been merely to show some, by no means all, of the opportunities that we in the M. of W. department have to improve our operations. I trust we have the ability to take advantage of these opportunities.

. . . The test of any maintenance operation hinges on the value of the operation to the good of the railroad as a whole. Thus, each sub-department should keep the other sub-department advised of its program so that all departments may cooperate and coordinate their respective efforts in a time and manner most advantageous to their railroad. It is my idea that the comparable officers in each department should confer regularly in order that work requiring combined efforts may be arranged to suit all concerned. . . .

. . . Such work trains as must be operated offer a challenge to get better results by planning well, training a good work-train gang, and securing the cooperation of the dispatcher and the train crew. I believe the success of work-train operations is, to a great extent, in the hands of the supervisors, but, where cooperation is at a low ebb, the division engineer must back him up with the superintendent. . . .

H. E. Durham of the A.A.R. research staff supervising the joint-packing work

Service Test Aims At More Facts On Joint Lubrication

Continuing its study of the effect of lubrication in preventing frozen rail joints, corrosion, and other rail-joint troubles, the Association of American Railroads has established a new test installation in high-speed track on the Illinois Central

• Its second investigation to determine to what extent lubrication will reduce the rate of fishing-surface wear and minimize the occurance of frozen joints has been launched by the research staff of the Association of American Railroads under the sponsorship of the Committee on Track of the American Railway Engineering Association. As the basis of this investigation a test installation of various types and combinations of lubricants has been established in main-line track on the Illinois Central.

The first test installation, located on the Chicago, Burlington & Quincy near Earlville, Ill., and now in its fifth year of service, was concerned primarily with lubricants and rust preventives which could be applied by brush or spray. While the investigation of various types of brush-on lubricants will be continued in the new test, greater attention will be given to the effectiveness of packing joints, i.e., filling the spaces between the joint bars and the rail with a lubricant and plugging the openings at the ends of the bars with a plastic material. Another objective of the new test is to investigate the effectiveness of end plugs, not only in retaining the lubricant in packed joints, but also in extending the service life of brush-on lubricants, and preventing corrosion by keeping out debris, brine and abrasive materials.

The test lubricants were installed in the northbound main track of

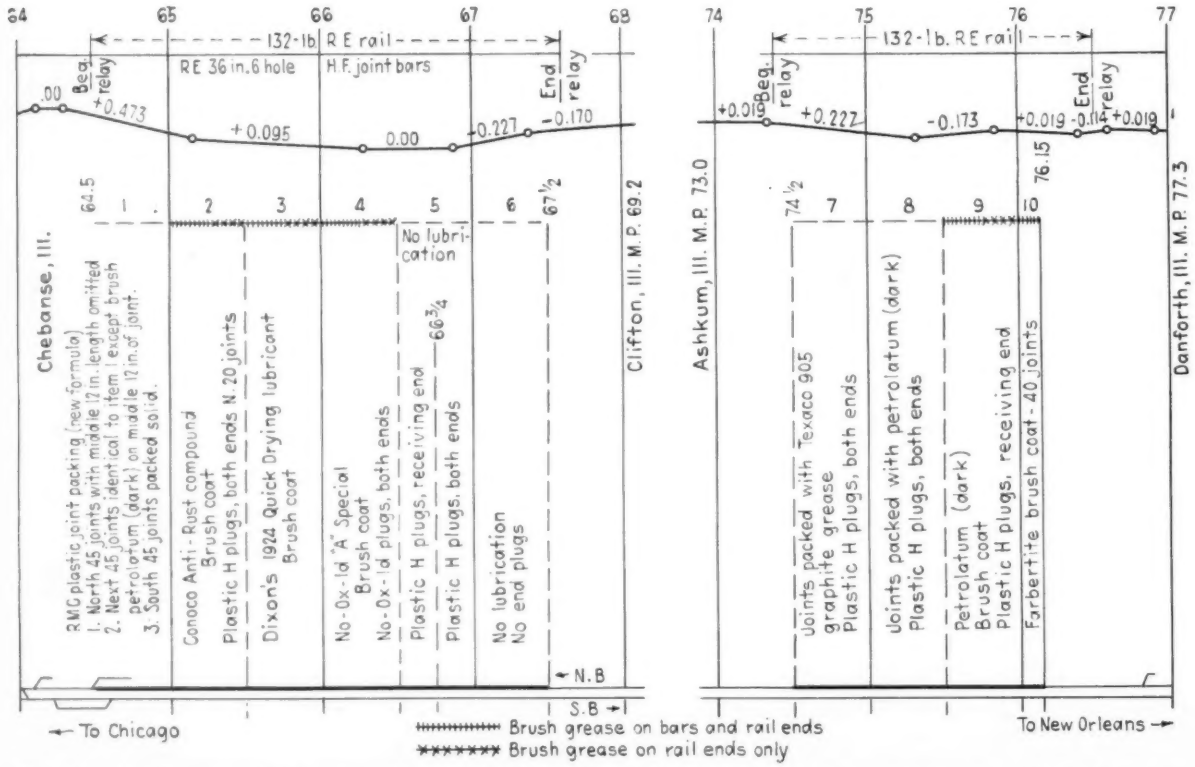
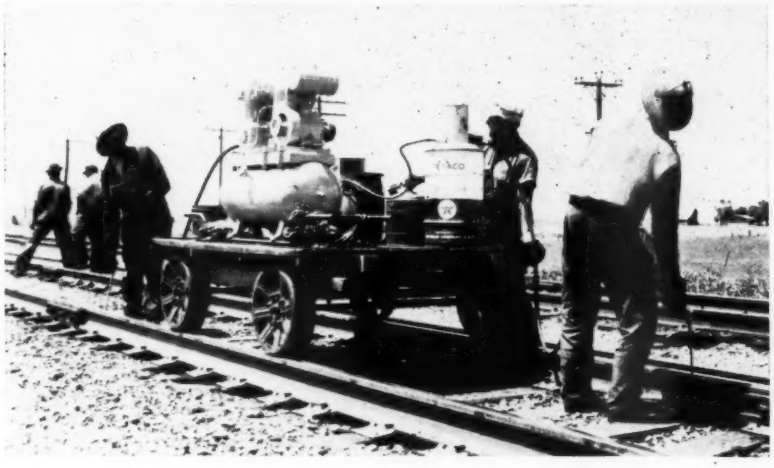


Chart showing the various types and combinations of lubricants installed by the A.A.R. for test purposes in main track on I. C.

The joint bars above were removed to show No-Ox-Id plugs applied mechanically by a machine (right) recently developed for this purpose by the Dearborn Chemical Company



Joint bars above were removed to show Texaco 905 graphite grease injected into the joint by special power pumping equipment (left) developed on Wabash

the Illinois Central near Clifton, Ill., about 13 mi. south of Kankakee. The test section consists of two stretches of track laid with new 132-lb. R.E. rail joined with new 36-in. 6-hole headfree joint bars. One of these stretches is 3 mi. long, extending from Mile Post 64.5 to Mile Post 67.5, and the other is 1.65 mi. long, extending from Mile Post 74.5 to Mile Post 76.15.

The test track is divided into 10 sections, which are numbered from 1 to 10 beginning at the north end of the northerly stretch. The different types of lubricants were assigned to nine of these sections. The joint bars of one section (No. 6) were given no lubrication, or end plugs, and will serve as controls in the test.

The various types of lubricants installed are indicated by the accompanying chart. The brush coats were applied at the time the rail was laid about the middle of June. The RMC plastic packing in section No. 1 was also applied at that time. The work of applying the end plugs and the remainder of the joint-packing was carried out after the rail was laid. This work was completed on June 30.

The Plastic H plugs in section No. 7 were applied by hand before the Texaco 905 graphite grease was injected by power pumping equipment of a type that was developed specifically for this purpose on the Wabash, and which has been in use on that road for a number of years. Prior to this year the Wabash used Texaco 904 grease for packing joints. The 905 grease is similar to the 904 except that it has a stiffer consistency. The pumping equipment, which is carried on a push car, consists of a gasoline-engine-driven air compressor mounted on top of an air-storage tank, and two grease dispensors. The dispensors fit the tops of 100-lb. grease drums and deliver the lubricant through lengths of hose to two grease guns equipped with special nozzles. Complete assemblies of this equipment are now being offered by Associated Industries, Decatur, Ill.

The pumping equipment was also used for injecting petrolatum into the joints in section No. 8. To expedite the work in the relatively cool weather prevailing, some of the material was placed in a heated toolhouse the night before, as the machine is not designed for pumping heavy grease of this type. The NO-OX-ID plugs in section No. 4 were applied mechanically by a special machine developed recently for this purpose by the Dearborn Chemical Company. A detailed description of this machine may be found in the July issue of *Railway Engineering and Maintenance*.

In subsequent years the research staff of the Engineering division of the A.A.R. will inspect the installation periodically and collect sufficient data to judge, eventually, the relative merits of the various products, combinations of products, and methods of application under test. Measurements of all joint gaps will be made twice a year and the amount of joint-bar pull-in or wear will be determined each summer by measuring, with calipers, the out-to-out distance between each pair of bars. Also one or two joints in each test section will be removed periodically, examined and photographed, to determine the condition of the lubricant and the amount that has disappeared due to weathering and wear. To supplement this information the Illinois Central will keep a record of all loose bolts, broken bolts, or joints that have pulled apart.

All the lubricants for the test installation were obtained for this purpose by the Association of American Railroads. The materials were donated by the manufacturers which also cooperated in many other ways. The labor for applying them was made available by the Illinois Central. The lubricants were installed under the supervision of H. E. Durham, track engineer of the A.A.R. research staff.

Concrete Pump Is Big Help On Culvert Job

When the New York Central began the task of filling in a pile trestle across a steep ravine in central New York recently, the major problem encountered was that of economically delivering concrete for a large box culvert at the base of the fill in a location that is virtually inaccessible. How this situation was successfully overcome with the aid of a Rex Pumpcrete machine is told in this article.

Use of concrete pump permitted setting up mixer in an easily accessible location

• The New York Central recently constructed a 61-ft. fill across a steep ravine at a point near Watkins Glen, N. Y., to replace a pile trestle built as an emergency measure 14 years ago. The major step in this project, prior to making the fill itself, was the construction of a 15-ft. by 15-ft. reinforced concrete box culvert, 197 ft. long, at the base of the fill, to carry a small stream at the bottom of the ravine.

The nature of the terrain at this point is such that to move a concrete mixer to a point convenient to the work would have been extremely difficult and the delivery of aggregates and cement to the site would have presented similar problems. For the same reason, the use of transit-mixed concrete was not practicable. However, a most satisfactory solution was found in the use of a concrete pump to move the concrete through a pipe from the mixer to the culvert forms. Thus, batching and mixing operations could be carried out at a location where the delivery of the concrete materials presented no problem. In addition, substantial labor savings were effected by eliminating the need for buggies to deliver concrete to the forms.

Work Done by Company Forces

The trestle involved carries the two main tracks of a branch of the New York Central's Pennsylvania division, extending from Lyons, N. Y., south to Jersey Shore, Pa., and is 234 ft. long and 61 ft. high. It was built in 1935 after a sudden flood filled the opening of the existing culvert with debris and washed out the original fill. Taxed by wartime traffic, the trestle became increasingly expensive to maintain in recent years, which was the principal factor in the decision to replace it with a fill and culvert. The entire project was carried out by company forces.

The 15-ft. square opening of the new culvert is considered ample to accommodate extreme run-offs from the drainage area involved. The culvert is slightly skewed to the track and is provided with a flared concrete apron extending beyond the out-fall end. Steel sheet piling was driven beneath the lower end of the apron to prevent scour. Construction of the culvert required 1800 cu. yd. of concrete and 100 tons of reinforcing steel. The fill involved 33,000 cu. yd. of material.

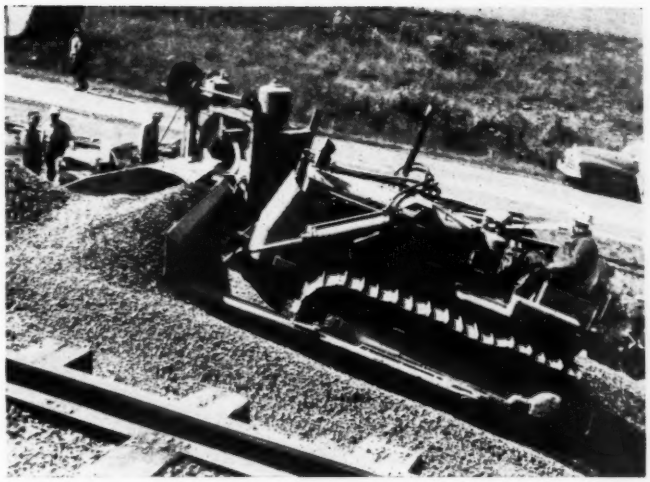
Mixing Plant Layout

A temporary siding was installed directly south of the trestle and just west of the southward track, on which cars of materials could be spotted for unloading. Stone and sand were unloaded by crane and piled adjacent to the siding. Bagged cement was moved to the site in box cars, which were spotted on the siding until emptied, thus affording a considerable saving in rehandling costs.

The mixer—a ⅝-cu. yd. unit—was spotted adjacent to the piles of aggregates and about 50 ft. west of the siding. At this point the level of the ground is about 10 ft. below that of the track, a feature that made it possible to slide bags of cement from the cars to the mixer over a wooden chute. The mixer, in turn, discharged directly into the receiver of a Rex Pumpcrete machine. This unit—rated at 15 to 20 cu. yd. per hr.—was equipped with a 6-in. discharge line which carried the concrete directly to the point of use. The length of the discharge line varied during the work, the maximum being approximately 400 ft.

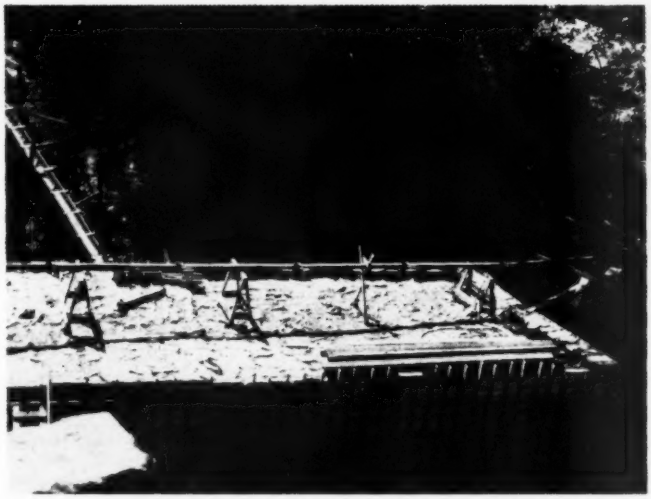
Batching Done by Crane

A 10-ton Bucyrus-Erie crawler crane, equipped with a clamshell bucket, was used to load the aggregates into the skip of the mixer.

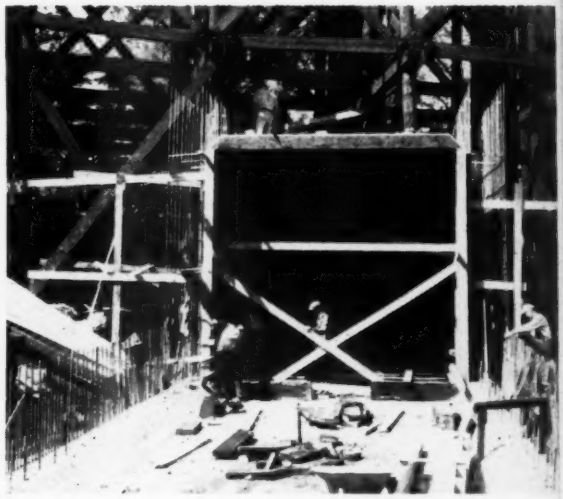


A Caterpillar bulldozer was used to move aggregate to batching crane

The pump handled between 15 and 20 cu. yd. an hour



Length of the discharge line of Pumpcrete machine varied up to 400 ft.



View of form work above the invert already in place

The location of the crane, the mixer and the piles of sand and stone was such that this loading could be carried on throughout a day of concreting with minimum shifting of the crane. A Caterpillar D-6 tractor bulldozer was brought into use, when necessary, to shove sand and stone within reach of the crane.

Measurement of stone and sand was accomplished by the crane operator, aided by a line, painted around the inside of the clamshell, to indicate the desired quantity. A 1:2:4 mix was used, the water-cement ratio being 6.25. The mixing time was sufficiently long to permit adjustment of the quantity of material in the bucket to insure accurate measurement. Water was pumped from a pond, made by damming the stream in the ravine, to an elevated tank near the mixer, and flowed by gravity to the mixer itself.

The volume of concrete placed in any one pour was determined by the location of construction joints in the culvert. The largest pour amounted to 154 cu. yd. and required nine hours to place. On another occasion, 92 cu. yd. were placed in five hours. Pours were made as frequently as possible, depending only on the ability of the carpenter forces to prepare the forms and the reinforcing.

Force

The force employed at the mixer consisted of six men—operators for the mixer, crane, bulldozer and concrete pump, and 2 laborers. In addition, carpenter and mason gangs were employed, as needed, to put up forms and assist in placing the concrete. The latter force varied in size, the maximum at any time being three foremen and 48 men.

The force was housed in camp cars, which were parked on a temporary siding just north of the trestle, within a few minutes walk from work.

The project was executed under the general direction of K. L. Miner, engineer of bridges, New York. Field work was supervised by Truman Campbell, bridge inspector, under the general direction of C. V. Bucher, division engineer of the Pennsylvania division, and T. B. Coolidge, supervisor of bridges and buildings, Jersey Shore, Pa.

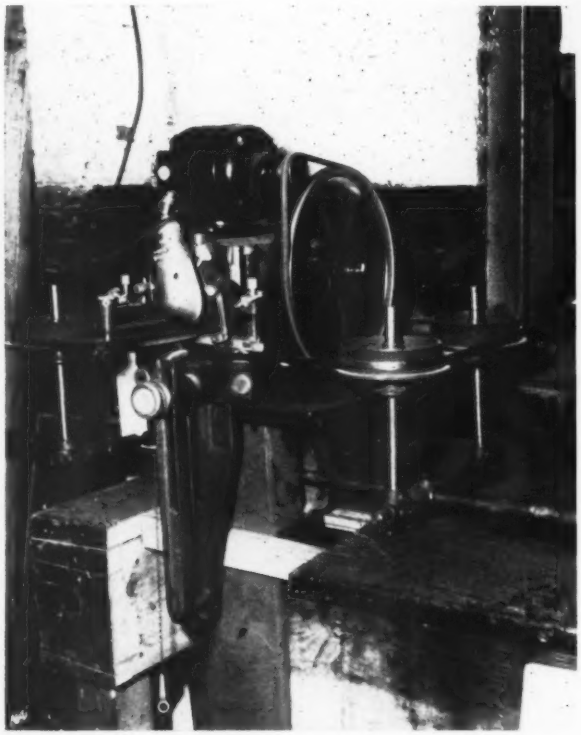
Mechanized Carpenter Shop

Does Many Things—

Above—I. J. Kubly, supervisor of bridges and buildings, watches "big sticker" cut rough board into siding

Right—The jointer dresses edges of lumber which has passed through planer or has been ripped on table saws

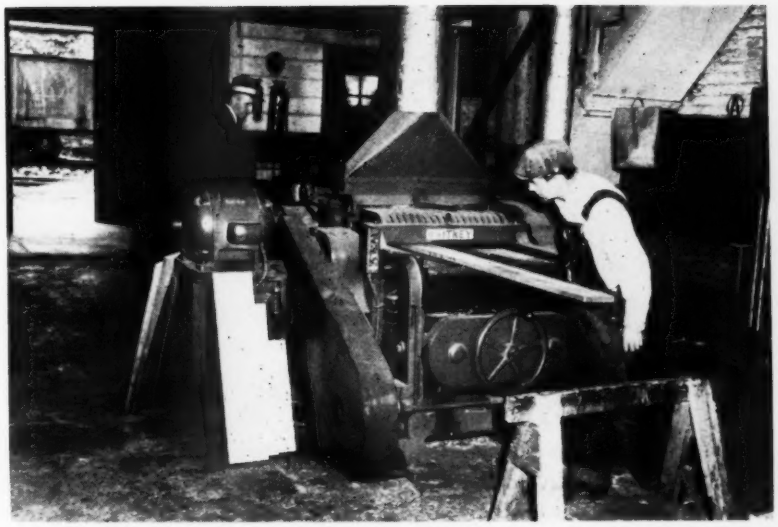
Below—This automatic saw-filing machine is used constantly to keep other units working at top efficiency



Right—Small but fast, this mortising machine saves cabinet makers many hours of tedious, exacting hand work

and Saves

From $25 to $40 per M ft. b.m. is saved by the Illinois Central by buying random lengths of rough, yellow pine lumber in carload lots and milling it in a highly-mechanized wood-working shop on its Chicago Terminal division, which is capable of furnishing dressed lumber to meet any need, or of turning out finished items from letter trays to desks.



This Whitney planer can simultaneously dress both top and bottom sides of lumber

• All of the millwork requirements of the Chicago Terminal division of the Illinois Central and some of the specific needs of the entire system are furnished by an exceptionally well-equipped carpenter shop located on the railroad's property at Twenty-Sixth street, Chicago. "There's nothing too big or too small for this shop", according to I. J. Kubly, supervisor of bridges and buildings, under whose supervision rough lumber, or material salvaged from retired railway structures, passes through the shop and comes out in the form of dressed lumber for any need or as cabinets, pieces of furniture, millwork, and other items.

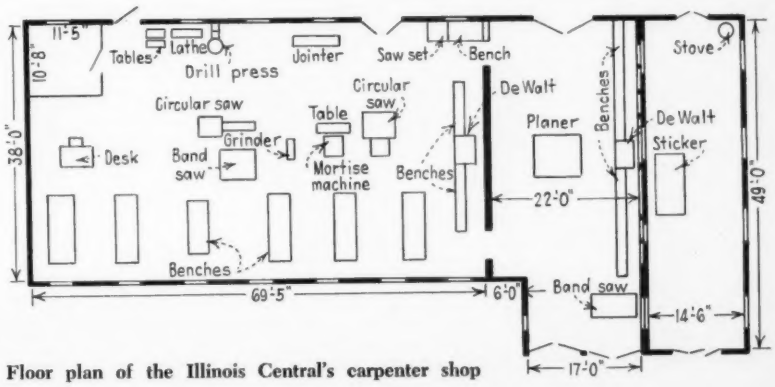
Although the shop is designed and used to supply the normal needs for lumber and millwork for the maintenance of buildings in the Chicago area, there is practically no limit to the work that it can do when necessary. For instance, crossing gates to satisfy the needs of the entire system are made at the shop. Should the building department desire to make major alterations to one of the terminal buildings, all it has to do is furnish the shop with detail plans or an "order" for the material required, and it will be supplied promptly. Included in the millwork which the shop can furnish are all types of doors and door frames, both exterior and interior; window frames and sash; complete screens, screen doors and storm windows; planks beaded on both sides for partitions or on one side only for panels or ceilings; mouldings of any kind; chair rails and baseboards, including coves; hardwood flooring dressed and matched but not end-matched; and any other requirements for dressed lumber. All pieces of lumber manufactured at the shop are cut to length so that they are ready for erection when they reach the building site.

The versatility of the shop is by no means exhausted when the material for the building itself is finished. If desired, the shop forces, aided by their power tools, can mill, dress and fabricate all the cabinet work required in the building, including shelves, filing cases, cabinets and drawers, cupboards, desks, and even letter trays and picture frames. The only piece of office furniture that hasn't been fabricated in the shop to date is a complete swivel chair. However, most of the individual members of such chairs have been made and installed during routine repairs of office chairs.

"Big Sticker" Is Key Machine

As soon as an order for building material is received and the quantities needed are known, the "big sticker"—a C-86 moulder—starts to whir. This machine, manufactured by the Yates-American Machine Company, Beloit, Wis., is the largest piece of power-operated equipment in the shop and is located in a room by itself at one end of the shop building. Its function is to mill rough lumber, up to a maximum of 6 in. by 12 in., on all four sides in one operation. A rough board goes in one side of the machine and, depending on which combination of its four cutter heads are in use, will come out the other side as ship-lap siding, No. 115 drop siding, beaded ceiling material, D & M decking or flooring, or a piece of lumber merely square-edge milled to dimension on all sides.

Because of its versatility, speed, and economy, the "big sticker" is the "pride and joy" of the shop force. It accomplishes its purpose by means of four demountable and replaceable cutter heads each of



Floor plan of the Illinois Central's carpenter shop

Hand wheel at right quickly changes this table saw from rip to cross-cut operation

which is operated by an individual electric motor. Another motor drives a belt which rotates a feed roller and controls the rate of feed which can be varied from 25 to 130 ft. per min. If necessary for one reason or another, the feed roller can be reversed to back out any piece of lumber that has passed partly through the machine.

The worth of the "big sticker" is aptly demonstrated by the fact that, for $5 per M ft. b.m., it can take rough 1-in. by 6-in. lumber costing about $95 per M and mould it into 1-in. by 5½-in. No. 115 drop siding which would cost $140 or more per M if purchased locally.

In a room adjacent to the one containing the "big sticker" are a large band saw, a Witney double-surfacing planer, and a DeWalt cut-off saw. The band saw is used for resawing timbers up to a maximum of 30 in. by 30 in. into boards having a minimum thickness of ½ in. The planer, another heavy-duty machine, is located in the middle of the floor and is capable of simultaneously dressing both the top and bottom sides of material up to 7 in. by 30 in. The Dewalt saw, located along one wall, is flanked on each side by a long table-top bench, and is used primarily to cut off medium-size lumber to size. One of its most recent duties was to fill an order for 600 floor blocks for a wheel shop, which were cut from creosoted 4-in. by 10-in. by 12-ft. timbers.

One Machine—50 Operations

The main carpentry shop is located in still another room. It contains another Dewalt saw, an automatic saw-filing machine, two table saws that are combination cut-off and rip units, a jointer, a mortising machine, a small band saw, a small bench grinder, a drill press, a lathe, a desk and six work benches. The Dewalt saw is the all-purpose tool of the carpentry shop, being a complete woodworking shop in itself. By fitting it with various types of saw blades, dado heads, shaper cutters, rabbeting and routing attachments, etc., more than 50 operations can be performed. One of the typical chores it accomplishes each spring is to shape enough screen-door and window moulding to assure adequate and insect-proof screens for all terminal buildings.

The saw-filing machine is fully automatic and can sharpen band saws of various lengths and cross-cut or rip circular saws of any size used in the shop. When the shop is going full tilt, this machine is in constant demand to keep the other units working at top efficiency.

Use of Jointer

Practically all of the lumber run through the planer is brought into the carpentry shop to have its edges dressed, one at a time, by the jointer. This machine also may be used to dress any of the pieces ripped on the table saws.

As mentioned, both of the table saws are combination machines which can be used to rip or cross-cut material as desired. However, one of them has both types of blades mounted eccentrically on a vertical, circular table so that, when the table is rotated by means of a hand wheel, either of the saws can be moved rapidly into position for use. The quick changeability of these blades is particularly beneficial for some types of operations.

The mortising machine is one of the smallest power-operated tools in the shop, yet its use saves many hours of tedious, exacting hand-chisel work in making and repairing furniture and cabinets. In the time it takes to set this device up and complete a mortise that will accurately fit the tenon desired, a man doing the job by hand would hardly have gathered his brace and bit, his chisels and his mallet together to start the job.

Work Benches

The six work benches are arranged parallel to each other and in a single-row along one windowed wall. Outlets are provided near the benches to permit the use of small electric tools such as sanders and drills. For use in laminating boards for desk tops or other purposes and for fastening furniture joints, electric glue pots are conveniently located with respect to all work benches.

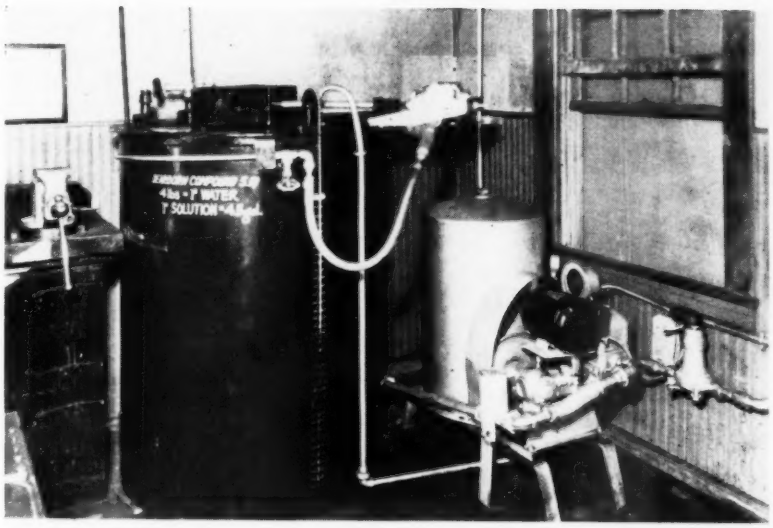
Most of the shop is heated by an oil-fired boiler that furnishes hot water to several overhead unit heaters strategically located, although the room in which the "big sticker" is located, being somewhat isolated from the other rooms, is heated by a standard pot-belly stove. Lighting is by means of factory-type shaded drop lights located at each machine or other working points.

Sawdust Is Salvaged

A standard blower system sucks the sawdust and shavings from all wood-working machines (except the resaw) and carries them to an outside metal hopper of the usual variety. At the resaw machine, the sawdust falls into a 4-ft. by 5-ft. pit from which it is removed with shovels from time to time. The sawdust is salvaged not only to keep the vicinity of each machine clean and assure better working conditions but also to put it to a useful purpose. It is bagged when taken from the hopper and sent to the South Water street freighthouse where it is used to cover oily spots in freight cars to protect lading. This use of the salvaged sawdust is saving the cost of the commercial sawdust that had to be purchased previously.

The operation of the carpenter shop at Twenty-Sixth street is under the general supervision of C. E. Weller, division engineer.

Automatic System for Treating Diesel Cooling Water



The K. & I. T.'s cooling-water treating plant is compact and takes up little space

• For more than a year all cooling water for Diesel locomotives on the Kentucky & Indiana Terminal has been automatically pretreated before being placed in Diesel cooling systems. This practice was instituted with the installation, at Louisville, Ky., of a simple and economical treating plant, automatic in operation, that provides a uniformity and an accuracy of treatment far beyond what was realized when the treatment was mixed and applied by hand methods. The result, according to the railroad, has been that all cooling-system difficulties, such as pitted cylinder liners, cylinder heads and water jackets, have been overcome.

The treating plant consists of a Dearco FM pump unit, with a 30-gal. pressure tank and a Mercoid pressure switch, and a Dearborn Type 180-HA chemical mixing tank which was equipped by the railroad with an air motor to drive the agitator paddle. The treatment used is a standard chromate type (Dearborn Formula No. 517). This chemical is dissolved in the mixing tank and the solution is added to the cooling water in proper proportions by the pump. The pump discharges the treated water into the pressure tank, where it is stored until needed. City water is used. Keeping the mixing tank supplied with the chemical is a part-time job for mechanic helpers.

The facility is located in the vicinity of the fueling station where all Diesel locomotives are inspected. The treated cooling water supplied at this location is used in passenger, freight and switching locomotives. Locomotives of the Baltimore & Ohio and the Chicago, Indianapolis & Louisville, in addition to those of the K.&I.T., obtain cooling water from this plant. The average total daily consumption by all the roads using the facility at the present time is 250 gal.

Driving Piles on New Cutoff

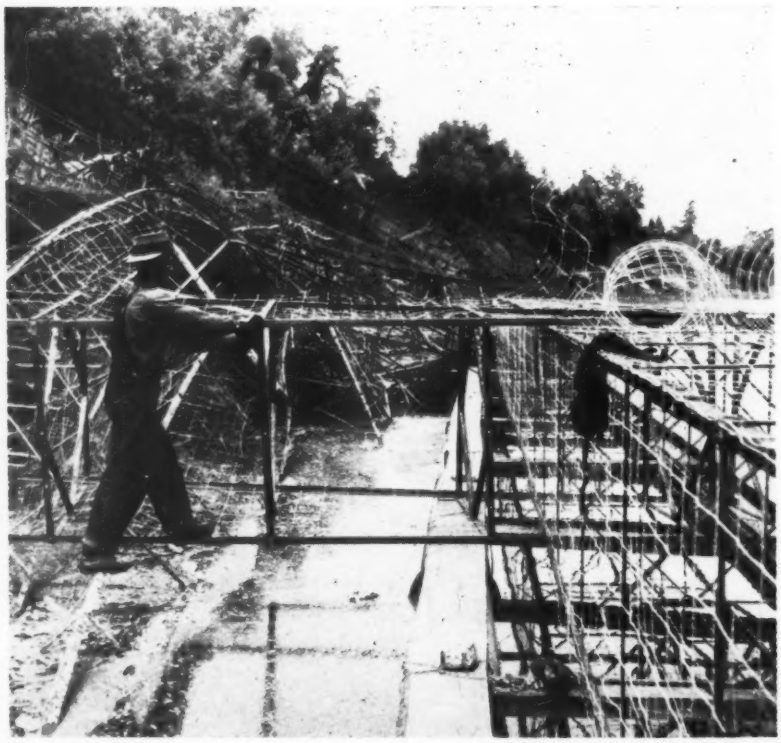
• Shown at the right is a Lorain MC 414 Moto-Crane driving piles for a new trestle on the Centennial Cutoff —a $16 million project now under way on the Chicago, Burlington & Quincy. This project involves the construction of about 49 miles of new single-track line in northwestern Missouri, and is designed to shorten and otherwise improve the road's line between Chicago and Kansas City, Mo.

The Moto-Crane in the picture is being operated by the John F. Abramson Construction Company, one of the bridge contractors on the job. It is equipped with a No. 2 Vulcan steam hammer and pile-driver leads designed and built especially for this job by the Missouri Valley Bridge & Iron Co., Leavenworth, Kan. The leads are hung from the crane-boom head by means of a swivel which permits swinging the base of the leads to either side of the center line of the boom. The base of the leads rests against a horizontal support projecting forward from the front of the crane turntable. The end of this support is equipped with a curved steel girder to which the leads may be clamped to give the proper angle for driving batter piles.

In moving forward on the trestle as the work progresses, the Moto-Crane is guided in tracks made of channels fastened to the trestle floor.

Metal permeable retards as a means of protecting river banks from erosion were first used on the Texas & Pacific in 1927. When they proved successful in countering erosion, their use was extended to other troublesome locations, and they are still being installed as a regular feature of the road's river-bank protection activities.

River Bank Protection



The fascine boxes consist of a framework of steel angles and flats covered with welded hog-wire fencing. A 10-man B. & B. gang can fabricate and place about 400 lin. ft. of the boxes per day

• Fascine boxes, or current retards, built of welded hog wire applied on a framework of steel angles braced with bolted flat iron, have been used successfully by the Texas & Pacific in river-bank protection along its lines for more than 20 years. The fascine boxes were the brainchild of the late R. L. Holmes, who was assistant chief engineer and later engineer water supply of the T. & P. The idea for the fascine boxes was first conceived by Mr. Holmes in about 1927 following a careful study of the problem of caving banks and erosion of river shore lines. Since then the road has made extensive use of the boxes and in so doing has developed effective procedures and techniques for installing them.

The original installation of the fascine boxes on the T. & P. and, as far as is known, in the United States, was undertaken near Powhatan, La., on the Red river in 1927. Other installations have since been made at Boyce, La., Zimmerman, Lake End, Armistead and Lucas on the Red river; at Twelve-Mile bayou near Shreveport, La., also on the Red river; and on the Brazos river near Brazos, Tex., on the Western division. At todays' wages and prices the cost of boxes in place is about $2.50 per lin. ft.

Last year when a sand bar caused the channel of the Red river to encroach on its right of way near Zimmerman, La., the T. & P. placed lines of fascine boxes at right angles to the current to produce a cutting action on the sand bar (left), and placed similar boxes, interlaced with the lateral lines, along the bank to prevent caving soil from falling into the water (opposite page)

with Fascine Boxes

On the Texas & Pacific

The road's standard plans for the boxes calls for a framework of angle iron, with flat pieces used as braces, held together with stove bolts. Two methods have been used for forming the retard on the framework. One of these, now considered obsolete, is to lace No. 8 soft iron wire through holes bored in the angles until a network is formed. The other is to use either 2-in. mesh chicken wire or hog wire fencing tied to the framework with baling or No. 8 wire. The relatively short life of the chicken wire has led to the almost exclusive use of welded hog wire having a 4-in. by 4-in. or 6-in. by 6-in. mesh. After construction and placement, the boxes are anchored to "deadmen" or trees, situated well back from the river bank, by ¾ in. or 1-in. wire rope.

An exception in the use of the angle-iron framework was the installation of the boxes along the Brazos river, where wood was used to form the framework and cheap cement blocks were utilized for weighting the boxes down. This construction was used because the Brazos river installation was made during the war year of 1942 when metal shapes and wire were in short supply.

As a general rule the boxes are placed on the downstream end of a bend in the river. The permeable retard design of the boxes serves to slow the velocity of the river current and also catch drift in the netting. By thus retarding the river flow, a deposition of the sand and silt carried in suspension is brought about. In time, this process builds up a sand bar along the river bank and causes the channel to be pushed back from its previous location. Metal is used in the fabrication of the fascine boxes to secure durability so that the boxes will be effective in keeping the river from encroaching again. The durability of the boxes also keeps the sand bar stable long enough for vegetation to grow, so that eventually the sand bar becomes the permanent bank of the river.

Methods of Assembly.

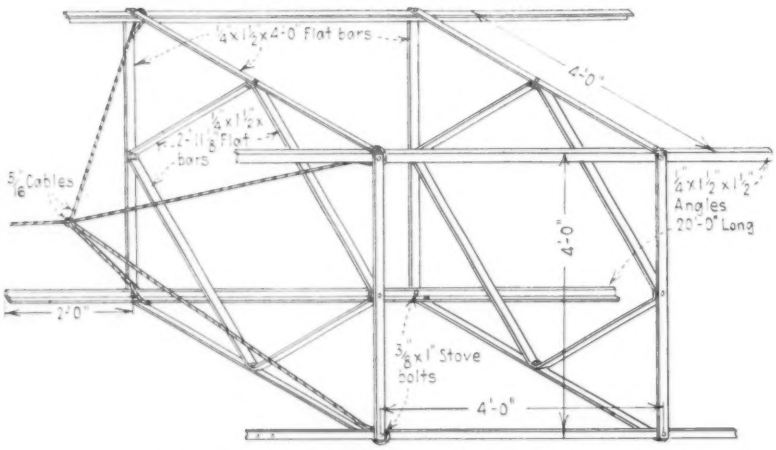
The boxes are assembled on the river bank and are moved into place by barges, sometimes in sections as long as 400 ft. Holes for the bolts and wires are factory bored in the angles and braces to keep field boring to a minimum. The boxes are placed as far as practical at right angles to the river current, and are anchored at the shore end. After being placed in the river, the boxes frequently are rolled by the current and at times may move to a position as much as 45 deg. from their original placement. After they have come to rest, the silt-settling and drift- catching process ensues, and, in time, the boxes either have become buried in the sand bar, or the drift catching under the boxes raises them up until the sand bar has built itself above the river, in which event the boxes are on dry land.

In the case of caving banks, longitudinal boxes are constructed along with, and interlocked to, the lateral boxes extending out into the river channel. These longitudinal boxes not only serve to catch silt and drift in time of high water, but also help to keep the bank from sliding into the river. They have been particularly useful along the Red river where caving banks, due to unstable soil, have led to much concern among the road's maintenance officers.

Only One Failure.

The only installation along the lines of the Texas & Pacific which failed to accomplish the purpose intended was one at Twelve-Mile bayou. This intallation, however, was not made by T.&P. forces, but by the U. S. Government. Over half of the boxes installed here were washed away, and the ones that remained were ineffective. Their failure was attributed to unstable soil conditions, leading to the failure of the "deadmen" and the breakage of the anchor cables during high water. However, the railroad believes that, even in this case, if the installation had been watched carefully, and adjustments made at the time the "deadmen" began to fail, the desired results would no doubt have been obtained. In all of the installations

Constructed on barges, the fascine boxes are moved into position and placed in river



Isometric view of the T. & P. standard steel fascine box for river bank protection

made by the T. & P. the railroad has found this follow-up work to be necessary. The army engineers have since driven pile dikes at Twelve-Mile bayou.

In the winter of 1935, the situation along the Red river at Armistead appeared hopeless. The river was in flood stage, a levee had already slid into the river, and about 50 ft. of the bank was caving in each day. It appeared that both the railway and an adjacent highway would soon go into the water. Mr. Holmes and John Short, now general water service inspector, were at the site with the highway and army engineers studying the situation. Mr. Holmes suggested the facine boxes as a possible answer, but the army and highway representatives expressed the opinion that the boxes would not be effective. However, after much discussion it was agreed to try the boxes, and the installation was made. According to Mr. Short, after the high water had receded, the river bank had been built out several hundred feet away from the danger point.

A pictorial record of the installation at Armistead was made by a series of photographs. The first exposure, taken August 16, 1935, shows the Red river, at flood stage and cutting into the bank. Another was taken on December 1, 1935, when all of the fascine boxes were in place. Others show the river channel moving away and depict the gradual formation of a sand bar, and the growth of vegetation.

In 1942 a dangerous situation had developed on the Brazos river at Red Bank cut on the Western division. At this point the railroad was built right on the bank in a bend in the river, and was backed against a high hill. Inasmuch as war shortages precluded the use of metal in the installation of fascine boxes, it was planned to take such temporary steps as were possible. The framework for the boxes was constructed of wood, and ordinary chicken and barbed wire were used as the netting. Concrete blocks were made and placed directly on the boxes for anchors. As a result of this installation, the river was pushed back about 100 ft.

B. & B. Gang Does the Work

At present there are two installations under way on the T. & P., both on the Louisiana division—one at Boyce, La., and the other at Zimmerman. This work is being done by a bridge and building gang consisting of a white foreman and about 10 negro laborers who are housed in prefabricated "Victory Huts" near the location of the installation. This gang can construct approximately 400 lin. ft. of the boxes per day, including the placement. When river conditions and the maintenance budget permit, all of this gang's time is spent on the work. In times of high water, the gang is assigned to other regular maintenance work.

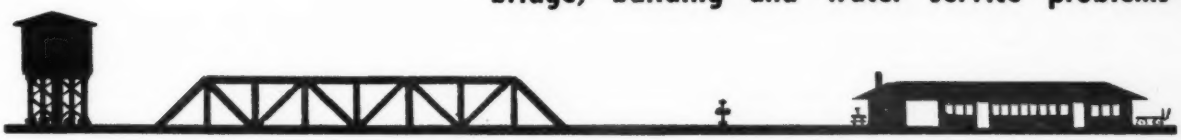
On any of the so-called "navigable streams", a permit for the installation of fascine boxes is necessary from the army engineers in whose district the work will take place. As a general rule, a written submission, accompanied by a drawing showing the location and the extent of the work, suffices to obtain the necessary permit, inasmuch as such permits are usually more or less routine.

Usually the land owners on the side of the river on which the work is to be done are only too glad to have the boxes installed, inasmuch as they protect their property as well as that of the railroad. The land owners on the other side of the river may have a different viewpoint but due to the fact that the army engineers have issued the necessary permit, their resistance is generally passive—in fact no resistance has as yet resulted in litigation.

It is believed on the T. & P. that, as a general rule, any condition of caving banks or river erosion, whether occuring at a bend or elsewhere, calls for the use of the boxes. Soil conditions usually do not provide any difficulties, other than the fact that consideration should be given to stability in the placing of the "deadmen" anchors, taking care to get the anchors well back to avoid washing or failure.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Unloading Rail from Flat Cars

What is the safest and most effective method of unloading new rail from flat cars handled by a work train? Explain the duties of each man involved in this operation. How many cars can be worked conveniently at one time?

Good Organization Pays Off

By L. C. BLANCHARD
Roadmaster, Chicago, Milwaukee, St. Paul & Pacific, Mitchell, S. D.

The safest and most effective method of unloading new rail from flat cars or sawed rail from gondola cars is by the use of a crawler crane mounted on a flat car. This type of crane has the speed and flexibility needed for the job. It can unload a gondola car of rail from one end, then swing, advance to the other end of the flat car and unload a car of rail at that end, thus making it possible to unload two gondola cars of rail before going to a station for a fresh supply. With the rail loaded on flat cars it is possible for the crane to progress from car to car as the rail is unloaded so that, within practical limits, any number of loads can be handled before it becomes necessary to switch the train.

With this arrangement it is not only practical but desirable for economic reasons to work two cranes simultaneously where the scope of the work will allow it.

The first operation is for an engineer to go ahead of the work train and chain off stations 195 ft. apart to contain five 39-ft. rails. The marks should be marked conspicuously with yellow keel and should be located 10 ft. back of the permanent location of the joint. This is to enable the rail-laying machine to pick up the rail and always move forward in the laying operation to follow. For sawed rails, the marks should be made an appropriate distance to contain five rails. The engineer also indicates the number of rails to be stock piled at bridges, crossings, etc. These are to be placed at the end or side that will be reached first in the rail-laying operation. The engineer will also indicate where short rails will be used on the low sides of curves so these spaces can be skipped and filled in later with rails of the proper length.

A crane operator and seven laborers work with each crane. The crane operator is the key man and should be highly skilled. Of the four laborers who work on the car, one man handles the tongs, while two end men, with the assistance of the fourth man, move the rail into position so the tongs can be applied to the exact center of the rail. Two men on the ground take the rail at the ends as it comes off the car and guide it into position. One of these men signals the crane operator when to drop the rail. The first rail is dropped to start at the mark made by the engineer. The next four rails are dropped end to end and the sixth is again lined up with the next mark. In this way the rails are kept uniformly spaced. The seventh man follows along to turn the rail on its side with the base towards the track.

Where a second crane is used the operation is organized in exactly the same way but this crane unloads the rail on the opposite

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To be Answered In the October Issue

1. When a crane is not available, what is the best method of unloading a frog from a gondola car? Explain.

2. What is the standard safety color code? Can it be adapted to railway use? Explain.

3. What are X-Rayls? Why must their service be limited to specific locations? For what classes of service are they suitable? Explain.

4. To what extent is it practicable to use laminated members for caps in pile trestles? Can other bridge members be laminated? What are the advantages and disadvantages of such practice?

5. What type of body is most suitable for work-equipment repair trucks? What tools and equipment should be provided?

6. In ion exchange water treatments, what is the distinction between cation exchangers and anion exchangers? Explain. How do regeneration methods differ for each?

7. How does the corrosion of steel members affect the maintenance of train sheds? Explain. What methods of controlling such corrosion are effective?

side of the track where that can be done. Both sides must move along together to prevent one crane standing around waiting for the other.

When organizing a gang of this kind the supervisor should have safety uppermost in mind. The first step is to call the men together and explain the many hazards of this work. Each man should be assigned to a specific job and the dangers of that position explained to him. The end men on the car must be constantly on the alert to keep their hands and feet from being pinched or rammed by the end of a rail. The tong man must be taught to handle the tongs in a safe manner, to watch his feet and, most particularly, to watch the swinging tongs when they are returned to him from over the side of the car.

The men on the ground must be alerted to reach for the rail, but to keep out from under it so they will not be hit if it drops accidently or unexpectedly. The man turning the rails on their sides must stay back far enough so that he can not possibly turn a rail onto the man ahead of him. The crane operator has a tremendous responsibility in trying to watch and protect all six men under the boom. He must be especially careful in bringing the swinging tongs back to the car after dropping a rail over the side. These tongs could kill a man if they struck him right, and are a constant hazard. If there is one place where safety shoes "pay-off", it is on a rail-distribution job and every man should be encouraged to provide himself with a pair. Goggles should be available at all times and used when needed. First aid kits should be at hand for immediate use.

After everyone knows his job and the safety aspect, the next important thing is production. Good timing is essential. It is possible to keep the train moving at a slow walk while putting off one rail after the other. Only occasionally should it be necessary to stop and these stops should be held to a minimum. When working two cranes this calls for nice timing, but it can be done with the possibility of unloading in excess of 30,000 lin. ft. of rail per day.*

The unloading of secondhand or sawed rails is somewhat more complicated by the fact that they must first be loaded on cars with the gage faces of the rails all one way in the car, so that the rail will be laid back in the track in the same position it was originally. These cars must then be switched under the cranes to correspond with the side on which they are to be unloaded. The cars should also be matched so that each crane will have as nearly as possible an equal number of rails to unload; otherwise one crane will be out of rail while the other is still unloading. The men in the car must watch each sawed rail as it is lifted to see that the gage face in on the right side and if not, to turn it. With gondola cars the men in the car can turn the rails to the best advantage. With flat cars the men on the ground should do the turning for obvious safety reasons. In all cases supervision of a high order is required to keep two cranes producing to capacity and with safety to all concerned.

* This method was employed to unload 47 mi. of rails this spring without a personal injury.—Editor.

Unload with Crane and Tongs

By Charles Miller
Assistant Roadmaster, Western Pacific, Elko, Nevada

To unload rail from a flat car I would like a revolving rail crane with an experienced operator, four men and an unloading foreman. It would be the foreman's responsibility to organize the unloading, to match the rail charts furnished by the engineering department and to handle all other necessary reports. I would want the crane equipped with tongs instead of slings, because there is always a mad scramble while unhooking slings at both rail ends and in passing the guide ropes from hand to hand up to the men on the car. Then, too, slings cannot be unhooked without stopping the train and are otherwise dangerous.

I would use two men on the car. With the aid of a light bar, one would place the rail in position to allow the second man to engage the tongs. These men would mark the center of the first rail so the boom of the crane could be adjusted until the tongs hung at the center mark. Once the crane boom is set properly, no more center marks are needed.

I would use two men on the ground, one guiding the front end of the rail in a straight line along the toepath and another the back end. This second man would give a "drop" signal to the crane operator when the rail is opposite the point at which it will be laid. When this man gives the signal, the crane operator releases the load and the tongs fall free. He then swings them up to the tong man so he can hook another rail. In this method everyone has plenty of time and the danger of someone falling down or getting caught by a rail is not as great as it is when two pairs of men are doing a mad dance with slings and ropes.

If a car of rail contains shorts they are allowed to sift through to the floor of the cars and, while the work train is in the clear for trains, are unloaded along the side track in piles according to length. After placing enough of the shorts at switches and other locations where they are needed such as on the low side of curves, the balance is used in a panel, between switches of a side track, where they can be located easily. The reloading of short rails should be done very carefully so that they may be distributed evenly. Following the last 39-ft. rail unloaded, place one-half of the 38's, then half of the 37's, half of the 36's, etc., down to the shortest rail to be used. Then work back up through the rest of the 36's, the rest of the 37's and the rest of the 38's into standard 39's again. It must be remembered that both rails, north and south (or east and west), must be matched 38 for 38, 37 for 37, etc. This system makes a nice smooth pattern of rail and joints that provides a smooth-sounding ride for our passengers.

Use Cranes If Possible

By O. H. Carpenter
General Roadmaster, Union Pacific, Pocatelllo, Idaho

It is presumed that this question refers to dropping the rails off the side of flat cars along the track. This is frequently done with second-hand rail for use in relaying side tracks and other unimportant tracks, but I cannot conceive of any railroad permitting it to be done with new rail, especially if it it be used in main tracks. Such new rail should be unloaded by a crane or cranes suitable for the work. Probably the most economical method is to use two cranes in the same work train, with each

unloading one line of rail. Cranes, in fact, can unload rail from gondolas almost as easily as from flat cars.

Where it is desired to "string" rail by dropping it from flat cars, two cars can be conveniently worked at the same time by unloading one line of rail from each car. However, I would not undertake to unload rail from more than two cars at a time. This operation requires, on each car, about five men equipped with suitable tools to work the rail gradually into a position from which it can be forced over the edge of the car at the proper time. I have seen either lining bars, rail forks, tamping bars or track shovels used for this work. I prefer to have one man with a lining bar separate the rail from the tier in the car, while the rest of the men move the rail over to the edge of the car with shovels staying behind the rail at all times. Shovels are light, are easily handled and seem to be the safest tool for this work. This kind of work requires constant, alert supervision and a foreman or his assistant should be on each car of rail being unloaded to supervise the work. Another man should be on the ground to signal the proper place to unload the rail, and to see that the rail does not foul the track after it is unloaded.

Where one or two cranes are used to unload rail, a tong man and one other man should assist each crane. They should measure each rail and mark it so the tongs can be applied at the center. As the rail is lifted these men should steady it until it is moved over the side of the car, so two men on the ground can steady it into place. If rail on the car is "balled in", the rails that have their bases up must be tipped over on their sides to keep them from falling on the men's feet. Until they have been turned over men should not step over them.

There should be a foreman on the ground to spot the train so the rail can be lowered in the proper place. If the crane unloading the first line of rail is spotted correctly, the second crane can "string" the other line by unloading a rail each time one is unloaded by the first crane. Two cranes can be used successfully in this manner only while full-length rails are being unloaded. Where it is necessary to pair up short rails, only one crane can be used to advantage. In such circumstances, it is generally best to let one crane unload the short rails in the yard to pair them up and then reload them for the other crane to take out on line and unload.

I do not think it is safe to unload more than two cars at the same time with one work train. However, the work train, where possible, should take enough cars out in the morning for a full day's work, so that it does not have to return to a terminal during the working day for additional cars.

Repairing Furniture or Cabinets

To what extent do bridge and building forces do furniture-repair or cabinet work? Where is such work performed? What are the advantages of this practice? Disadvantages? Explain.

Now Done in Central Shop

By P. X. Simpson
Bridge and Building Supervisor, Northern Pacific, Tacoma, Wash.

Before the advent of modern wood-working equipment, the bridge and building department usually had one or two cabinet makers, whose main duties were to repair furniture, build file cases and do other cabinet work. However, when electrically-driven equipment for shop work became available, our management decided that it was too expensive to repair furniture by hand and such cabinet work was transferred to our large shops at South Tacoma, Wash. That is where the major part of this class of work is now being performed. However, we do have our local carpenter shop modernized to the extent that power saws, planers, drill presses, etc., have been installed and a small amount of cabinet work is done with the aid of these machines. On the other hand, B.&B. carpenters are often called on to make minor repairs to furniture and cabinets at scattered locations over the division.

In this area during the past eight or nine years, especially during the war, we lost many of our best mechanics and now do not have enough personnel capable of making first class furniture repairs or doing fine cabinet work. Under the present circumstances it will be some time before a better class of mechanics can be obtained to replace those we lost.

Switch Stands for Yard Use

What type of switch stand is best adapted to use in yards? Does the kind of yard make any differenece? What other factors are involved? Explain.

Automatic Stand Preferable

By H. C. Koch
Roadmaster, Belt Railway of Chicago, Clearing Yard, Chicago

Exclusive of those at power-operated hump switches, there are three types of switch stands for general use in yards: (1) Rigid switch stands with breakable lugs; (2) rigid switch stands with non-breakable lugs; and (3) automatic switch stands.

When an engine or car trails through a switch that is not lined for the movement, it creates a condition commonly known as a "run-through" switch and causes damage to rigid switch stands equipped either with breakable or non-breakable lugs. In the first case only one part of the lug breaks (some lugs have four breakable segments). When switches equipped with switch stands having non-breakable lugs are "run through" there may be considerable damage such as broken stands, bent switch points, connecting rods and head rods. The hazard created by such rigid stands is not in this initial damage but in the damage and danger that results if a train crew does not notice or report the accident. A facing movement through one of these damaged switches, unless detected and reported, later usually results in a more costly derailment.

To obviate these hazards and

damage, automatic switch stands are used quite extensively in many yards. When switches equipped with this type of switch stand are "run through", the switch points spring over with a "snap" for the movement being made. Target and lamp indications also change but the throwing lever does not move. A facing movement after such a "run-through" does not cause damage to such switches because the switch points remain automatically lined up tightly against the stock rail. There is no difference in the ease of manually throwing either rigid or automatic switch stands.

At locations where switch levers are locked in one position for a definite reason, rigid switch stands with non-breakable lugs should be used. If automatic switch stand were used at these locations and the switches were "run through" they would be locked for the opposite movement and the intent of the locking would be nullified.

While it is true that no damage results when automatic stands are "run through", it is good practice in most instances to require crews to line these switches for the trailing movement being made. It has been necessary to issue instructions for crews to do this—as trainmen soon learn the easy way out. There are a few exceptions to this rule, usually at junctions where time is saved by not stopping trains. These locations should be covered by special bulletins.

All switch stands require maintenance such as cleaning, oiling, and adjustment. Important items to watch in such maintenance are the rods connecting switch stands with the switch points, bolts, amount of throw of switch points, ease of movement at the heel of switch, surface and cross level in the switch, gage of track, condition of ties, especially headblocks, and the cleaning and oiling of switch plates. All of these have a definite bearing on the operation of the stands, especially where so-called automatic stands are used. These switch stands require a definite throw of the switch points (approximately 3¾ in. to 4¾ in.) so that the car or engine wheels coming in contact with the switch points move them enough to allow the spring mechanism in the switch stand to move past "center" and "snap" the points closed in the new position. Automatic switch stands are more expensive than rigid stands but one operation through a damaged switch equipped with a rigid switch stand will cause expense and perhaps a costly personal injury that could easily pay for a number of the higher-priced automatic switch stands.

Buffer-type spring switch stands that open for the trailing movements are not usually used in yard service because the switch points move back to the original position under standing cars or engines and, if a train is backed up in a case of this kind, even for taking slack, a derailment is likely to occur. Instructions to line these switches before making reverse movements are frequently overlooked. This type of stand can be used at junctions of outbound leads where trains are not required to stop, but they should be covered by bulletin.

In territories where snow falls it is important that it is cleaned out of switch points before such switches are thrown, either manually or automatically, to avoid damage to switch points, rods, etc., and otherwise cause switches to get out of adjustment.

It is my belief, based on experience, that automatic switch stands are best adapted for general yard use.

Some Types Save Trouble

By N. F. Alberts
General Foreman, Chicago, Milwaukee, St. Paul & Pacific, Chicago

My experience with various types of switch stands in yards has convinced me that in locations where many trailing movements are made and where "run-through" switches are frequent, automatic switch stands of the ground-throw type give satisfactory results. Even though the price of these stands may exceed that of some other stands, they pay for themselves in the long run.

At some locations we have experienced trouble with derailments occuring after switches have been run through because trainmen have failed to line the switches for a facing movement. These derailments have not only disrupted yard and road schedules, but have involved the spending of large sums to rerail cars and locomotives and to replace damaged track material in restoring the track to service. However, after installing some automatic-type switch stands at some of these locations, our trouble seems to have been practically eliminated.

The kind of yard in which switch stands are used makes a great deal of difference. For instance, where switching is being done on a ladder track, either for making up trains or for classification purposes, whether the switch stands are being operated by yard crews or assigned switch tenders, we find that the ordinary switch stand of the ground-throw type is best adapted if properly installed, adequately maintained, well lubricated and not equipped with the ordinary lever latches.

Automatic-type switch stands or other improved types are most desirable at those locations where frequent trailing movements are being made over the switches, such as outlets in engine terminals, outbound leads or running tracks in yards and where switch tenders are not assigned.

Stop "Run-Through" Troubles

By A. F. Huber
Chief Engineer, American Brake Shoe Company, Ramapo Ajax Division, Chicago

Automatic switch stands are especially adapted for yard use to eliminate the costly damage to stands, track, and derailed equipment that have been known to result when switches with rigid stands are accidently "run-through" by cars or locomotives. When such accidents occur on a switch equipped with an automatic stand, the switch will be thrown to aline with the movement of the train which can then proceed or back up without any damage or loss of time. Furthermore, during this operation the target or lamp is revolved to indicate the correct position of the switch points, thus leaving the switch entirely safe for following movements.

Experience of most railroads has indicated that even strict rules and discipline have failed to prevent the occasional "run-through" switch. By eliminating the delays and repairs that usually result from such lapses, automatic stands have proven their worth.

Automatic stands are used in all types of yards where switches are hand thrown, as the operating conditions are similar even though some switches are much busier than others. They provide a resi-

lient connection that absorbs track vibration and reduces wear in the rods and fittings. Many railroads have been using automatic switch stands for 20 years or more, and the number in use is steadily increasing.

Latching Devices Hazardous

By GEORGE S. CRITES
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Generally in all yards, switch stands should throw any switch with little effort on the part of the operator and should lock the switch points in position by some type of mechanism within the stand and not by latches fastened onto ties.

On ladders, where switches are likely to be "run through", the stands should flop the switch points to the opposite position and lock them there when all wheels have passed through. This will avoid cocked switches and bad "spills". The target must give positive indication of the position of the switch points, even when they have been "run through".

Stands on fast pull-in tracks should be up to main-track standards. It is preferable to have the locking device on such stands within the stand so that latches or keepers are not needed as such devices are more or less hazardous. If hooks are supplied with latches, yardmen invariably throw them away. Pull-out switches are usually equipped with spring mechanisms, either within the stand or as a part of the throw rod. Location and usage will determine which type is preferable.

Type Depends on Location

By A. DRAGER
M/W Storekeeper, Central Railroad of New Jersey, Elizabethport, N. J.

The location of the switch in relation to leads into other tracks, the type of freight movement, and the kind of yard operated should be the determining factors as to what type of switch is best adapted to use in any yard.

Generally the rigid-type switch stand, which does not permit the switch to be "run through" in trailing movements is preferable in passenger-train yards, in the immediate vicinity of float bridges and docks, and where it is desired that equipment come to a full stop before moving through a switch.

In many other locations, such as switch yards, engine leads and on tracks where it is not objectionable to run-through switches, the automatic stands are effective. These stands are designed to operate so that the switch points are forced open by the first pair of wheels, and the throw is automatically completed by the mechanism of the stand, which throws the switch points completely over. These stands eliminate expensive repairs caused by damage to tracks, equipment, and stands when rigid stands are run through and put out of service.

Such automatic switch stands are thrown by hand in facing movements only, therefore, they are less fatiguing to train crews because the physical effort to throw the switch in trailing movements is eliminated. This reduces the possibility of ruptures, strains, sprains, or other injuries to trainmen and thereby results in their better performance. Because this type of stand eliminates the replacement of damaged or broken parts caused by running through switches, and speeds up yard switching it should be used wherever possible.

Protecting Creosoted Cut-off Piles

What is the best method of protecting the tops of creosoted piles from decay after they have been cut off? Are any of the newer brush-on preservatives adaptable to such use? Explain.

Soak Top with Hot Creosote

By E. S. BIRKENWALD
Engineer of Bridges, Western Lines, Southern, Cincinnati, Ohio

The best method of protecting the tops of creosoted piles from decay after they have been cut off is to apply a mud ring about one inch high on the top of each pile and pour hot creosote oil into the ring. Sometimes the pile will absorb as much as four to five pourings, equivalent to ½ gal. or more. The pile should then be sealed with hot pitch, thinned with creosoted oil if necessary, on top of which should be placed a 20-gage sheet-metal cover. Metal rings, about one inch high, of diameters to fit varying sizes of piles, may be used instead of mud rings.

Possibly there are newer brush-on preservatives adaptable to this use, but it appears that before such a preservative is applied, it would be essential to use hot creosote oil to saturate the top fibers of the pile. To be effective in this use, any brush-on preservative, other than hot pitch, would have to be compatible with cresote oil.

Using Commercially Dried Sand

What are the advantages and disadvantages of using commercially dried sand for locomotives, compared to sand dried at the point of use? Explain.

Has Several Advantages

By H. E. DONOVAN
Vice-President, T. W. Snow Construction Company, Chicago

In recent years railroads have been more interested than ever in reducing labor and operating costs in general. All phases of railroad operation have been or are being studied to determine what can be done to bring about reductions in operating expenses. Locomotive sand-handling and preparation costs can be examined at most terminals, and the results in many cases will be revealing.

It has been the practice on most railroads to buy wet sand and transport it to the point of use in open gondolas. There the sand is unloaded by crane or conveyor and placed in open ground storage or in storage bins preparatory to drying. The sand is dried as required, and then ordinarily conveyed pneumatically to the servicing structure. While the cost of sand at the pit is reasonable—about 50 cents per ton—the various handling and

processing charges add dollars to the total unit cost.

During recent years commercially dried silica sand has become available in many sections of the country, at a cost, loaded in cars at the plant, varying from $1.25 to $2.50 per ton. This sand is shipped to point of use in either box cars or covered hopper cars (40 to 60 tons capacity), and upon reaching its destination is placed in weatherproof storage. Servicing facilities can be so designed that one structure serves both as a storage unit as well as a servicing structure. In one method sand is received in 40-ton box cars and conveyed pneumatically to storage from a special receiving hopper. Unloading costs vary from 25 to 50 cents per ton, depending on the method employed.

The advantages of using commercially-dried sand are: (1) It eliminates labor and operating expense involved in the drying operation; (2) it reduces handling expense, in that sand in many cases is handled only once after it reaches point of use; and (3) unsightly and space-wasting storage is eliminated. Commercially-dried sand can be purchased according to specification with a resultant uniform quality and a minimum of fines.

As to disadvantages, the original cost and transportation to point of use may be high and not justified at some locations. Unless adequate storage is provided, close attention to procurement is required to the end that an ample supply is on hand at all times.

Saves Handling and Drying

By Engineer of Water Service

The advantage of using commercially dried sand for locomotives is in the savings incident to the unloading and storing of the sand. If overhead or above-ground storage is provided of carload or greater capacity, then sand cars can be unloaded directly into the storage tanks or bins and then directly dispensed to locomotives or Diesels without rehandling. This method adapts itself to several above-ground tanks and is used by a large number of roads for storing sand for Diesels.

Using dry sand eliminates the maintenance of sand-drying equipment at each location where sand is used and the extra cost of handling wet sand in winter weather. The only disadvantage in using dried sand is that cars, as well as storage bins, must be moisture-proof.

Fires in Asphalt Roofing Mops

How serious is the possibility of spontaneous heating of stored asphalt-saturated mops used in applying built-up roofs? What precautions should be taken to minimize the danger of fire from this cause?

The Danger Is Real

By G. A. Belden

Assistant Chief Engineer, Central of Georgia, Savannah, Ga.

The seriousness of the danger of spontaneous heating and ignition of roofing mops that are being used for applying asphalt built-up roofs can possibly be emphasized by citing two actual experiences.

One of these happened during the application of an asphalt built-up roof on a pier shed about two years ago. Asphalt was being heated in an oil-fired kettle to a temperature of about 400 deg. F. on the wharf margin and raised to the roof deck on an elevator in 5-gal. buckets. As the weather was comparatively warm at the time the asphalt was being applied, its temperature was probably close to 400 deg. Ordinary cotton roof mops were being used in spreading the hot asphalt and, as one of the roofers was going down from the roof for dinner he laid his mop down with the head hanging over a timber and exposed to the air. When he returned about 30 min. later the head of the mop had ignited and been completely consumed by fire, but fortunately the fire did not spread to any other combustible materials and burned itself out without doing any other damage.

A few days later one of the roofers, having finished mopping hot asphalt at one location, was moving to a new area about 100 ft. away and was carrying his mop with the handle on his shoulder and with the head hanging down about two feet from his back. Before he had gone more than 50 ft. the mop had ignited and was burning briskly when another workman called attention to the fire which was extinguished by throwing the mop down and stamping the fire out.

We had previously applied a large number of built-up asphalt roofs but this was a new and surprising experience and we were so sure that there was something in the mop yarn that was causing the ignition that we sent a sample of the yarn and the asphalt to the National Fire Protection Association. This organization, in turn, sent the samples to the Committee on Spontaneous Heating and Ignition, Bureau of Explosives, A.A.R., who made some exhaustive tests but was unable to offer any explanation as to the cause of the ignition of the mops.

However, since our experience on that job we are convinced that there is a very serious danger of roof maps igniting spontaneously after being used for mopping hot asphalt and we are taking the precaution of keeping buckets of water on the roof and placing the mop heads in these buckets as soon as the mopping is finished. We believe this is a wise precaution to take when applying either asphalt or coal-tar pitch.

May Occur in Cold Weather

By N. H. Davis, Jr.

Assistant Secretary, Underwriters' Laboratories, Inc., Chicago

Cases of apparent spontaneous ignition of mops used to apply asphalt to roofs have come to our attention infrequently over a long period of years. Discussion with the roofing industry seems to indicate that this phenomenon is more apt to occur in cold weather. Apparently when a mop saturated with hot asphalt is laid aside, the asphalt on the outside of the mop hardens, preventing to a considerable extent the escape of heat from the still molten asphalt in the interior. The temperature of this asphalt may readily be high enough to cause ignition of the yarn in the mop after a varying period of time.

We do not believe that it can

be attributed to any recent change in either the asphalt or the yarn used in the mops, and it probably can be best prevented by reasonable care on the part of the applicators to remove hot saturated mops to locations where they will not cause unnecessary damage if ignition does occur.

Isolate Storage Cabinets

By W. C. HARMON

Bridge and Building Supervisor, Southern Pacific, San Francisco, Cal.

The possibility of fire by spontaneous combustion in stored roofing mops, exists where carelessness is condoned around a roofing job. These jobs can be a real fire hazard unless watched closely. That we have no instance of record of any fire from this source is primarily due to the fact that our roofing applications requiring such equipment have been made largely by contractors.

With the necessary ingredients inherent in a large number of roofing materials, it only remains for the proper conditions to be set up to make fire by spontaneous combustion possible and even probable.

Much of our roofing coatings, especially the primers, contain fish oil, linseed oil, vegetable oil, mineral oil or gilsonite. Some of these have a low flash point, are readily susceptible to rapid heating and, when confined, these vehicles combined with the cotton mops customarily used in the work, provide all the essentials for a fire by spontaneous combustion.

Good housekeeping and common-sense precautions should prevent this trouble. These mops should be hung by the handle with mop end down over a drip pan in a metal cabinet provided with ample vents for air at the top and bottom. The cabinet should be placed in an isolated part of the yard where a fire would not endanger other property.

Clean Well Before Storage

By H. M. HARLOW

Assistant General Supervisor, Bridges and Buildings, Chesapeake & Ohio, Richmond, Va.

It is hard to conceive of spontaneous heating starting a fire in a mop saturated with asphalt, but I suppose the records are not to be denied. In spite of this, my guess would be that the possibility of starting a fire from this cause would be rather remote.

A mop used to apply asphalt on built-up roofs should always be cleaned before storing it or else it will be unfit to use again without cleaning at greater cost than immediately after use. The cleaning of the mop can be done with a standard solvent, which if inflammable, can be mixed with an equal amount of carbon-tetrachloride to reduce the flammability. The mop should be dried thoroughly after cleaning and then stored for future use.

The storage place should be well ventilated, and should preferably consist of a rack or an open shelf. The essential point is to provide ventilation. All well-founded fire-prevention rules forbid storing rags in closed places and the same practice should prevail in the case of roofing mops.

Dumping Attachments for Trucks

What are the advantages of equipping trucks used by the maintenance forces with body dumping attachments? To what extent is it desirable to provide M/W trucks with such attachments? Explain.

Add Utility to Stake Bodies

By H. MAYER

Engineer Scales & Work Equipment, Chicago & North Western, Chicago

During 1949 the Chicago & North Western System purchased a number of trucks for use by track-maintenance and bridge and building gangs. These were 1½-ton trucks with steel stake-bodies over which canvas tops were stretched on bows. The bodies had folding side seats, dumping attachments and folding steps at the rear.

With trucks of this type, track-maintenance and B.&B. gangs with tools are transported speedily, efficiently and comfortably from their headquarters direct to the job. This method reduces the delay often encountered in transporting men and tools on motor cars. The trucks were equipped with dumping attachments to eliminate the unloading by hand labor of such material as lumber, snow, debris, sand, gravel, coal, cinders and other material which can be dumped without injury to the material.

By handling and transporting materials in this manner we can expect some reduction in work-train service, a reduction in the number of material cars used by the track and B.&B. departments, and a reduction in the expense of switching material cars.

Properly programmed, the first duties of the truck would be to transport men and tools to the job, after which it would then be available for the handling of new and old materials to and from the gang, and finally for returning the gang to its headquarters at night.

Other uses which can be made of these trucks include supplying coal to heating plants, depots and freighthouses, taking away cinders from such heating plants and distributing them where they can be used, loading and removing snow from driveways, and for such other emergency uses as may be deemed necessary.

Likes Stake-Body Dumps

By TRACK FOREMAN

In purchasing trucks careful consideration should be given to the purpose for which the truck will be needed. I have found that the 1½-ton long wheel-base, stake body with dumping attachment, is an all-purpose truck and when available is the most used truck in service. This type of truck will handle and dump most track material, such as frogs, tie plates, switch ties and crossties. The driver can unload a truck equipped with a dumping attachment but will need help for non-equipped types. When men or small equipment are being handled the body can be locked to the frame and cannot be dumped by mistake.

Trucks with short wheel bases and regular dump bodies are only built to haul stone, dirt, etc., and are not readily adaptable for transporting men or long materials.

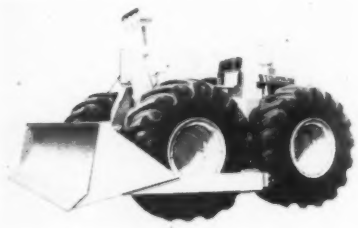
PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices

(For additional information on any of the products described in these columns, use postcards, page 703)

SMALL TOURNADOZER

FOR earth-moving jobs not requiring the use of large grading equipment, R. G. Le Tourneau, Inc., Peoria, Ill., is now offering the Model Super D Tournadozer—a four-wheel tractor dozer which is about 3500 lb. lighter than the



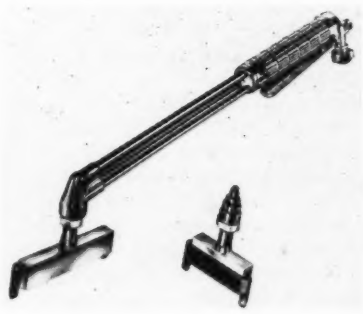
standard-size Tournadozer and has a bucket capacity of 1.8 cu. yd. compared with 2.5 cu. yd. for the larger model. Powered by a 122-hp. Diesel engine, the Super D has four speeds forward up to 19 m.p.h., and two in reverse. Like the larger unit, it is mounted on big rubber tires which permit operation over soft ground.

The Super D is equipped with a Tournamatic transmission and air-synchronized multiple-disc clutches. Steering is accomplished through the actuation of the clutches and brakes.

BURNER FEATURES FAST PAINT OXIDATION

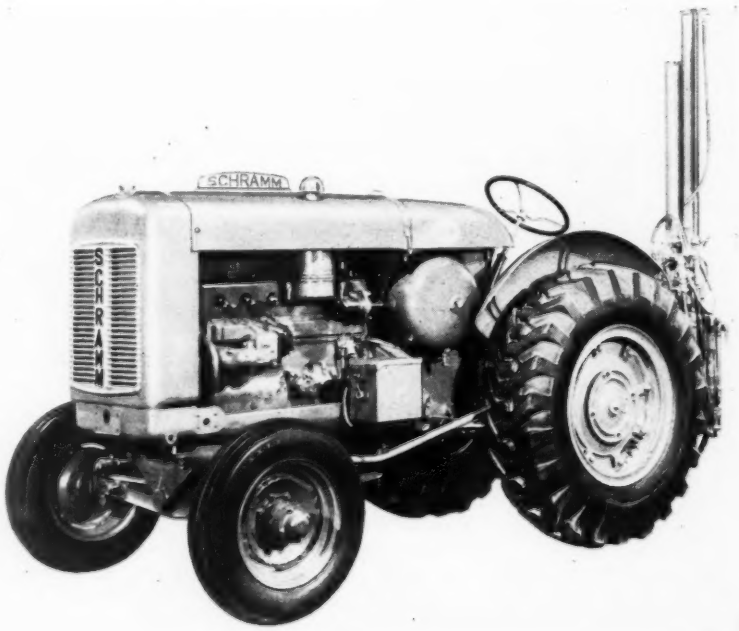
THE National Cylinder Gas Company, Chicago, has announced a burner for removing paint from metal surfaces, in which an oxyacetylene flame is supplemented by a low-velocity flow of pure oxygen. This combination is reported to cause rapid oxidation of the heated paint, resulting, it is said, in faster and more thorough removal of the paint. The burner may also be used for the removal of scale and rust.

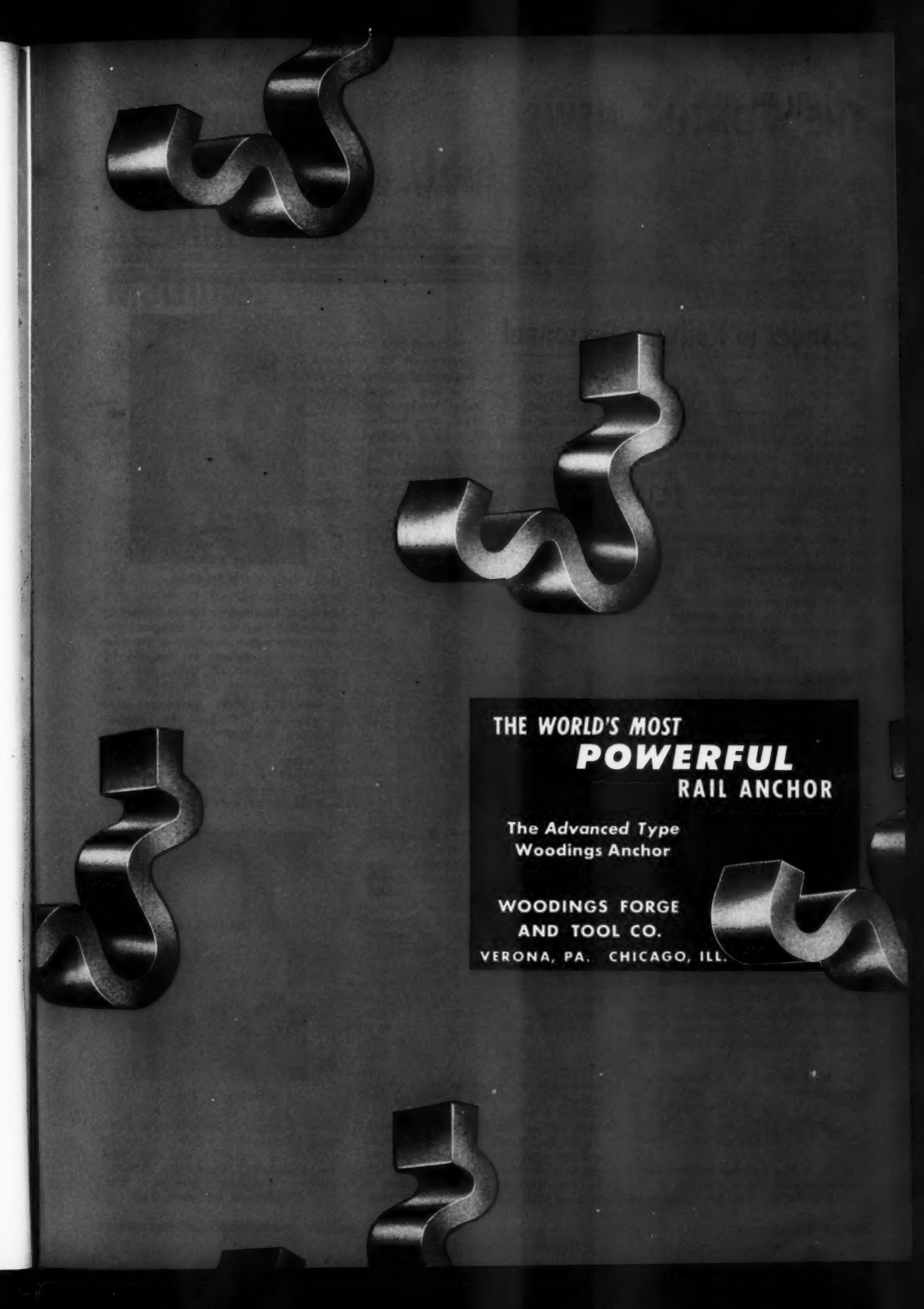
The burner is designed for use with the National Cylinder Gas Company's Torchweld 75 hand cutting torch. It is provided with replaceable wear - resistant shoes which maintain the proper distance between the burner and the surface to be heated. With a 4-in. burner it is reported that paint can be removed at a rate of about 600 sq. ft. per hr.



SCHRAMM PNEUMAJACK

SCHRAMM, Inc., West Chester, Pa., is introducing a new attachment for the Schramm Pneumatractor—a self-propelled tractor-compressor combination. This attachment, known as the Pneumajack, and designed for drilling holes in concrete or stone, consists of a pneumatic cylinder mounted on a vertical column at the rear of the tractor. The cylinder feeds and lifts a piston rod fitted with either a D-55 or D-45 Schramm rock drill. The piston rod has a movement of 36 in. The Pneumajack can also be furnished with two BT backfill tampers or a B-80 paving breaker. With a proper adapter these tools and the drills may be used interchangeably.

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AND TOOL CO.
VERONA, PA. CHICAGO, ILL.

THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers

Changes in Railway Personnel

General

L. H. Dahl, roadmaster on the Northern Pacific, with headquarters at Laurel, Mont., has been promoted to trainmaster, with headquarters at Billings, Mont.

David C. Horne, assistant engineer on the Central of Georgia, has been appointed assistant land and tax agent.

John A. Rust, division engineer on the Southern at Greenville, S. C., has been appointed trainmaster, with the same headquarters.

H. S. Unangst, assistant division engineer of the New York division of the Pennsylvania, has been appointed boatmaster of the New York division, with headquarters at Jersey City, N. J.

James B. Clark, division engineer on the Louisville & Nashville, at Birmingham, Ala., has been promoted to the newly created position of assistant to the general manager, with headquarters at Louisville, Ky.

C. H. Burgess, assistant general manager of the Northern Pacific, at Seattle, Wash., and an engineer by training and experience, has been promoted to general manager, Eastern district, with headquarters at St. Paul, Minn. He succeeds **C. V. Berglund,** who has retired.

Engineering

R. B. Aldridge, assistant valuation engineer of the Missouri-Kansas-Texas, has been promoted to valuation engineer, with headquarters as before at St. Louis, Mo.

J. M. Gariepy, chief draftsman of the Canadian Pacific, at Montreal, Que., retired recently after 47 years of service.

N. M. Kelly and **N. B. Roberts** have been appointed assistant engineers in the office of engineer, maintenance of way, Eastern region, of the Canadian Pacific, with headquarters at Toronto, Ont.

G. W. Miller, assistant engineer maintenance of way, Eastern region, of the Canadian Pacific, with headquarters at Toronto, Ont., has been promoted to engineer maintenance of way, Eastern region, with the same headquarters, succeeding **A. O. Wolf,** who has retired after nearly 42 years of railroad service.

W. H. Hudson, Jr., assistant chief engineer of the St. Louis Southwestern, with headquarters at Tyler, Tex., has been promoted to chief engineer, with the same headquarters. He succeeds **W. S. Hanley,** who has retired after

W. H. Hudson, Jr.

more than 50 years of railroad service.

Mr. Hudson became associated with the Cotton Belt in 1926, after graduating in civil engineering from Washington University. He was appointed division engineer in 1945, and assistant chief engineer three years later.

W. E. Griffiths, whose appointment as assistant chief engineer of the Central region of the Canadian National, with headquarters at Toronto, Ont., was announced in the June issue, was born at Ilford, England, and was graduated from McGill university in 1931. After serving with a number of engineering companies, and as an engineer for the city of Toronto, Mr. Griffith entered railroad service in 1937 as a concrete inspector on the Canadian National. Later, he served as instrumentman, assistant engineer and assistant division engineer at Montreal, Que. In 1944, he was appointed division enginer at Ottawa, Ont., and, in 1946, was transferred to Montreal in the same capacity. Later that year, he was appointed general maintenance inspector in the office of the chief engineer at Montreal, becoming engineer of track, with the same headquarters, in the fall of 1947.

W. E. Griffiths

Gordon L. Plow, whose promotion to engineer of track of the Canadian National, at Montreal, Que., was announced in the June issue, was born at St. Albans, Vt., on June 27, 1902, and graduated in civil engineering from McGill university in 1924. He began railroad service with the Chicago, Rock Island & Pacific in June, 1924, as chainman, subsequently serving in various engineering capacities on that road, the Canadian National, the Canadian Pacific, Canadian Airways, Ltd.,

(Continued on page 758)

Gordon L. Plow

Self-Propelled Air Compressors Used As Multi-Purpose Machines

A highly useful auxiliary attachment to the Pneumatractor is the front end loader for handling excavated material, snow, debris, etc. The ½ yard or 2/3 yard bucket lifts high to clear the top of a dump truck or gondola. A counterbalance ballast box may be attached at the rear if heavy material is handled.

Schramm's new self-propelled compressor, the Pneumatractor, lends itself to many non-air uses as well as the usual tie tamping and other air jobs.

• No matter how railroads may now, or in the future, handle their large scale track resurfacing, they will always need flexible four and eight-tamper units. And air compressors are best for powering such units because of their versatility, for they are not limited to tamping as are specialized devices. Spray painting, spike driving, and other jobs are done by the same compressors which power the tampers.

This multiple air use is an appreciated feature of the Schramm Pneumatractor, product of more than 30 years' experience building self-propelled compressors. The Pneumatractor, an off-track compressor, increases the number of jobs air can do, for its complete mobility takes it wherever the work is, even to places of difficult access.

The Pneumatractor's Power Plant

The Pneumatractor's Pneumapower units have compressor and power cylinders integrally cast and balanced in the cylinder block. The 60 and 105 c.f.m. models serve four to eight tampers or other tools.

Standard on the 105 and optional on the 60 is the Pneumastat which permits the compressor to operate continuously from part to full capacity without loading or unloading. This cuts fuel consumption as much as 50 per cent!

The Pneumatractor as a Tractor

When not being used as a compressor, the Pneumatractor becomes a regular tractor, doing towing jobs such as mowing, etc.

Auxiliary attachments convert the Pneumatractor to special uses. These include a plow for snow clearing, a rotary brush, front end loader, front and rear winches, backfill blade for filling small excavations, and a post hole auger. Pneumatic tools for rear mounting include a Pneumajack medium or heavy duty rock drill, Pneumabreaker for breaking concrete, Pneumatamp or Backfill tampers. The mounting of tools is completely interchangeable.

Greater Investment Dividends

By extending its use to non-air jobs, your Pneumatractor will seldom be idle; thus it will earn a greater return on its investment.

Other Schramm Self-Propelled and Portable Models

The complete Schramm compressor line includes models from 20 to 420 cubic feet capacity, and has been improved during 50 years of manufacturing. A popular unit is the Model 60 Crawler. This also has complete mobility and accommodates auxiliary attachments. In addition, it is easily self-loaded on a section car or truck trailer for quick transportation to the job.

Write Schramm for Full Details

A new bulletin describing the Pneumatractor's features and uses is ready and will be sent upon request. Address Schramm, Incorporated, Railway Sales Department, West Chester, Pennsylvania. Ask for Bulletin NEU 50B.

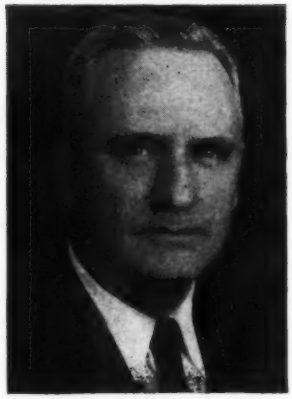
Close-up of 105-foot Pneumatractor. The 60-foot model, also with Unipower motor and compressor, is of the same general appearance.

ADVERTISEMENT

and for private contractors. He returned to the Canadian National in May, 1936, serving as instrumentman on the Laurentian and Levis divisions until May, 1941, when he entered military service. In January, 1946, he returned to the Canadian National as assistant division engineer of the Laurentian division, at Quebe, and was promoted to division engineer the following month, occupying that position on the Ottawa, Levis and London divisions until October, 1948, when he was appointed general maintenance inspector at Montreal. In March, 1949 Mr. Plow was promoted to senior assistant engineer, with the same headquarters, which position he held at the time of his recent appointment.

Edgar Bennett, chief engineer maintenance of way and structures of the Eastern lines of the Southern, at Charlotte, N.C., has been appointed assistant chief engineer, system, at Washington, D.C., succeeding **George L. Sitton,** who has been appointed assistant to chief engineer at Washington. Mr. Bennett, in turn, has been succeeded by **J. Floyd Beaver,** superintendent at Alexandria, Va.

Mr. Bennett was born on May 26, 1886, at Irvington, Ky., and attended Kentucky State University from 1905 to 1909. He entered railroad service



Edgar Bennett

in September, 1909, as rodman and transitman with the Southern at Danville, Ky., and then served successively as assistant engineer on enginehouse construction and terminal improvement, assistant engineer maintenance of way, and resident engineer of the Southwestern district at Chattanooga, Tenn. In April, 1920, Mr. Bennett was appointed assistant engineer at Chattanooga and five years later was named roadmaster of the New Orleans & Northeastern and the New Orleans Terminal (both Southern subsidiaries). He became engineer maintenance of way and structures at Macon, Ga., in July, 1927, being transferred to Knoxville, Tenn., the following year. Mr. Bennett was advanced to assistant chief engineer maintenance of way and structures of the Central lines at Knoxville in August, 1934, and was promoted to chief engineer maintenance of way and structures of those lines in January, 1944. He was transferred in the same capacity to the Eastern lines, at Charlotte, in December, 1947.

Mr. Beaver was born at Spencer, N.C., on October 2, 1903, and attended

J. Floyd Beaver

North Carolina State college. He entered the service of the Southern in 1926, as student apprentice, subsequently advancing to assistant track supervisor and track supervisor. In

(Continued on page 760)

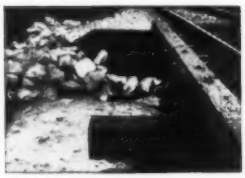
Protect Timber Bridges and Trestles From Grass and Weed Fires...Use

BORASCU®

...the Concentrated Borate Ore

FOR EFFECTIVE WEED CONTROL

Do away with fire-hazardous weeds and grasses about timber bridges and trestles, tie piles and buildings the thrifty, modern way . . . with BORASCU! Eliminate costly, labor-consuming, shovel-cutting operations too by using safe, non-corrosive, and economical BORASCU . . . the low-priced concentrated borate ore.



BORASCU is the ideal chemical because it is non-selective and destroys most all vegetation. When correctly used, BORASCU should prevent the growth of vegetation for 12 to 24 months, or longer. BORASCU is applied dry, just as it comes from the convenient, easily disposable, 100-lb. bags. Your section hands can apply BORASCU, without tieing up tracks and equipment, by following simple directions. A common 12-quart pail and BORASCU are all that is required to eliminate weeds and grasses.

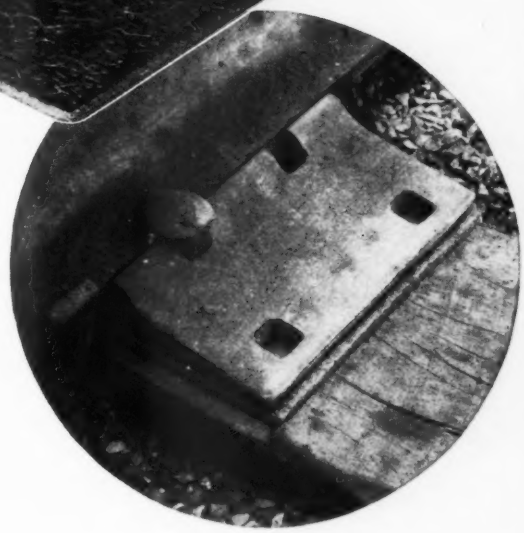
- *Start your economy in weed control now . . . write at once for your copy of the latest Borascu bulletin containing full information and address of our Weed Control Field Office nearest to you.*

PACIFIC COAST BORAX CO.

DIVISION OF BORAX CONSOLIDATED, LIMITED

510 WEST SIXTH STREET • LOS ANGELES 14, CALIFORNIA

Burkart Tie Pads ...the Pads that BREATHE* with strength



*The patented process used in the manufacture of Burkart Tie Pads will not trap water between pad and tie — they constantly breathe and eliminate moisture without any loss of strength.

Burkart Tie Pads are not affected by extremes of temperature. Stability remains constant under all conditions.

These tough and permanently resilient pads slow down rot and decay, reduce the cost and the danger of loosened spikes, spread rails and battered rail ends and eliminate tie abrasion and plate cutting.

F. BURKART MFG. CO.
Railroad Tie Pad Division
4900 No. 2nd St., St. Louis 7, Mo.

November, 1942, he was appointed roadmaster at Greenville, S.C. On April 16, 1944, Mr. Beaver was appointed trainmaster at Greensboro, N. C. Two years later he was promoted to superintendent at Richmond, Va., and was transferred to Alexandria in the same capacity in November, 1947.

William B. Jackson, assistant division engineer of the Levis division of the Canadian National, at Levis, Que., has been appointed division engineer of the Cochrane division, at Cochrane, Ont., succeeding **V. S. Fowlow,** who has been transferred.

David J. White, assistant designing engineer on the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to assistant engineer, with the same headquarters, and will be in charge of the preparation of contracts and agreements. He is succeeded by **R. C. Turnbell,** architectural engineer.

Claude Johnston, assistant division engineer on the Louisville & Nashville, with headquarters at Mobile, Ala., has been promoted to division engineer, with headquarters at Birmingham, Ala. He succeeds **James B. Clark,** whose promotion to assistant to general manager is announced elsewhere in these columns. Promoted to succeed Mr. Johnson as assistant division engineer, at Mobile, is **Charles T. Yarbrough,** assistant engineer at Louisville.

C. T. Jackson, chief engineer of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, has retired after 47 years of service, embracing location, construction, valuation and maintenance. Promoted to succeed Mr. Jackson as chief engineer is **W. G. Powrie,** assistant chief engineer, at Chicago, who in turn, is succeeded by **H. B. Christianson,** principal assistant engineer, also at Chicago.

Robert A. M. Deal, bridge and building supervisor on the Southern at Greenville, S. C., has been promoted to division engineer at Charleston, S. C., to succeed **E. Allen Gill,** who has been transferred to Greenville. Mr. Gill, in turn replaces **John A. Rust,** whose appointment as trainmaster at Greenville, is announced elsewhere in these columns.

Wyatt H. McNairy, track supervisor on the Southern at Charlottesville, Va., has been promoted to assistant division engineer, at Charlotte, N. C. Mr. McNairy was born at Greensboro, N. C., on March 9, 1914. He began service with the Southern as roadway apprentice at Charlottesville in June, 1935, becoming student apprentice at Winston-Salem, N. C., in July, 1935. He was appointed track supervisor at Camden, S. C., in November, 1937; at Branchville, S. C., in November, 1938; and at Batesburg, S. C., in November, 1941. He was transferred to Charlottesville in April, 1943.

Track

George P. McKenna, supervisor of track on the Boston & Albany at Worcester, Mass., recently retired after 44 years' service.

Earle W. Carney, section foreman on the Southern, has been promoted to assistant track supervisor at Hickory, N. C.

The headquarters of **R. L. Peters,** roadmaster on the River division of the St. Louis - San Francisco, has been changed from Kennett, Mo., to Chaffee, Mo.

Dennis L. Belk, assistant track supervisor on the Southern at Atlanta, Ga., has been advanced to track supervisor at Griffith, Ga., replacing **M. Otis Grant,** who has been transferred to McDonough, Ga.

H. F. Davenport, assistant supervisor of track on the Kentucky division of the Illinois Central, has been promoted to supervisor of track, with headquarters at Mendenhall, Miss., succeeding **W. F. Stewart** who has been transferred to Dyersburg, Tenn. Mr. Stewart succeeds **D. T. Crocker,** who has retired.

BALLAST IS SCREENED BY CONTRACT — ELIMINATING INVESTMENT BY RAILROADS IN THIS ONE OPERATION EQUIPMENT . . .

Stone ballast cleaned by the Speno method is thoroughly cleaned because it is screened twice. In order to obtain a thorough cleaning, two passes are necessary to restore the ballast to as clean a condition as when it was originally placed in the track. The two passes are accomplished in less time than a single pass by other mechanical methods.

Preferably, the ballast is cleaned ahead of a general track raise, and under the Speno method, no cribbing is necessary. Because of the drainage that the Speno method attains, the cleaning lasts from one general raise until it is time for another general raise, normally over a period of from three to six years, depending on conditions.

Speno equipment, working under traffic without interference with railroad operation, (the track adjacent to the one being worked is not fouled by our equipment in working position) easily keeps ahead of track raising programs.

The high production and low cost of this service are worthy of consideration.

FRANK SPENO RAILROAD BALLAST CLEANING CO. INC.

306 North Cayuga Street Ithaca, New York

R. B. Birkett, assistant supervisor of track on the Iowa division of the Illinois Central, has been appointed supervisor of track, with headquarters at Fort Dodge, Iowa, succeeding **B. E. Moss,** who has retired after 40 years of service. **H. C. Hadskey,** section foreman on the Vicksburg division, has been appointed supervisor of track, with headquarters at Monroe, La., succeeding **J. H. Edmonson,** who has retired because of illness.

Bridge and Building

William L. Taylor, bridge and building foreman on the Southern at Birmingham, Ala., has been advanced to bridge and building supervisor at Jasper, Ala.

L. W. Brown, carpenter foreman on the Chesapeake & Ohio, has been appointed assistant supervisor of bridges and buildings, with headquarters at Peru, Ind.

James Pullar, architect on the Canadian National, at Moncton, N. B., has been appointed building engineer of the Atlantic region, with same headquarters, succeeding **H. J. Crudge,** who has retired.

Albert C. Jones has been appointed supervisor of bridges and buildings on the Birmingham division of the Southern, with headquarters at Birmingham, Ala., succeeding **Harry L. Veith,** who has been transferred to Louisville, Ky., in the same capacity.

Special

J. C. Blackburn has been appointed supervisor of welding, maintenance of way, on the Seaboard Air Line, with headquarters at Jacksonville, Fla.

James H. Logan has been appointed general scale inspector of the Southern Pacific, with headquarters at Oakland, Cal., succeeding **William J. Stone,** who has retired after more than 33 years of continuous service with the Southern Pacific.

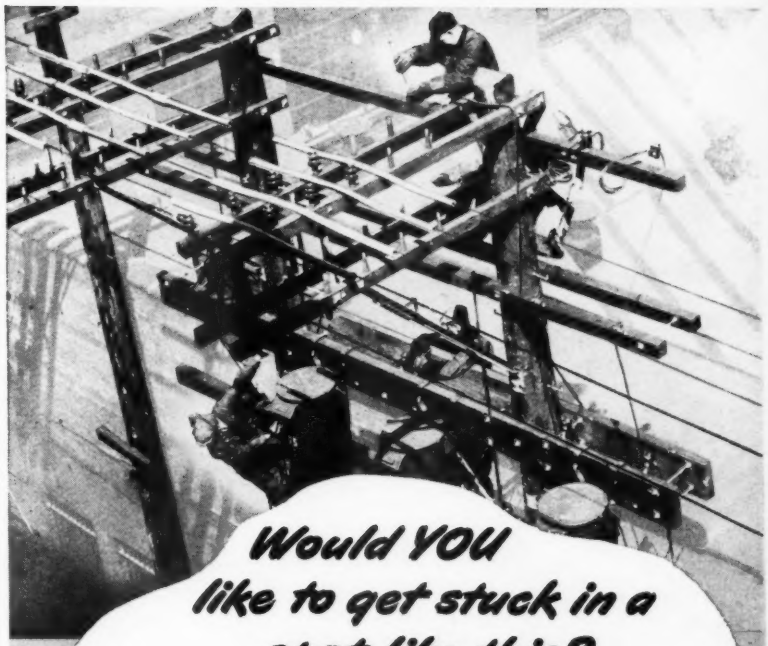
Obituary

N. H. Self, retired roadmaster on the Southern, died at Mobile, Ala., on April 23.

Stanley C. Hall, resident engineer in the engineering department of the Erie, at Buffalo, N. Y., died on April 25 at the age of 60 years.

J. T. Stotler, who was appointed assistant general manager of the Western district of the Northern Pacific, with headquarters at Seattle, Wash., on July 1, died in St. Paul, Minn., on July 13 after a brief illness.

(Please turn to page 762)



Would YOU like to get stuck in a spot like this?

Your linemen don't like to work on sticky, dirty poles and crossarms any better than you would. Of course, you must protect your poles and crossarms against rot and insects, but you can do it the *clean* way—the Penta Preservative way—at no extra cost and with positive knowledge that you're getting maximum protection.

You are sure with Penta because **penta**chlorophenol is a chemical entity, not a formulation or residue. It's exactly the same substance that it was 100 years ago; if it were different in any way it couldn't legally be called **penta**chlorophenol. Past performance records credited to Penta are based on the identical substance you buy today under that name.

Penta treated wood is clean, not sticky, not irritating to the skin. Your men will appreciate that fact. Yet it costs nothing to consider their feelings, because wood is treated with Penta in the same manner and with the same equipment as other accepted preservative materials, which themselves cost as much as Penta.

Add up the facts and see for yourself if it doesn't sound like a paying proposition. Just drop us a line and we'll be glad to send full information.

CHAPMAN CHEMICAL COMPANY
772 DERMON BUILDING • MEMPHIS 3, TENN.

TRADE CHAPMAN MARK

• IT'S CERTAIN • IT'S CLEAN •
IT'S CLEAN **PENTA** IT'S CERTAIN
PRESERVATIVE
• IT'S CERTAIN • IT'S CLEAN •

SIMPLIFY MAINTENANCE
with
TIE-SAVER PADS
Achuff Railway Supply Co. 5627 Manchester Ave. St. Louis 10, Mo.

Association News

Roadmasters' Association

The Executive committee of the association met at the Engineer's Club, Chicago, on July 10, primarily for the purpose of "previewing" the six technical committee reports that are to be presented at the convention to be held at the Stevens hotel, Chicago, on September 18-20. All but one of the committee chairmen were present to read their reports. The reports generally were found to be in good shape, giving promise of interesting and constructive sessions at the convention. Other details of the convention were also discussed.

Present at the meeting was Lewis Thomas, director of exhibits of the Track Supply Association and the Bridge and Building Supply Men's Association, which groups are planning a joint exhibit to be held at the Coliseum during the concurrent conventions of the Roadmasters' Association and the American Railway Bridge and Building Association. Mr. Thomas discussed various aspects of the proposed exhibit, pointing out that it would be of record proportions.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 13-15, 1951, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—H. L. Dawson, Secretary-treasurer, 839 Seventeenth Street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—E. C. Gunther, Secretary, 122 S. Michigan Avenue, Chicago 3.

Maintenance of Way Club of Chicago—E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., Secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, Secretary; Lewis Thomas, assistant, Secretary 59 E. Van Buren street, Chicago 5.

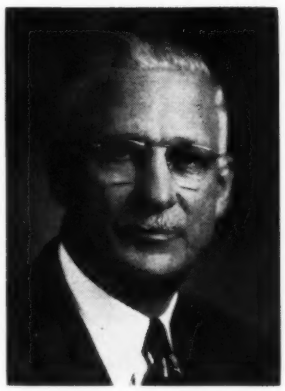
Railway Tie Association—Annual meeting, August 28-30, 1950, Brown Hotel, Louisville, Ky., Roy M. Edmonds, Secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago, 5.

American Railway Engineering Association

As a result of amendments to the constitution, approved by far more than a two-thirds majority of the membership, H. S. Loeffler, assistant chief engineer of the Great Northern, and senior vice-president of the association, has moved automatically to the office of president.



H. S. Loeffler

At the same time T. A. Blair, chief engineer, system, of the Atchison, Topeka & Santa Fe, and junior vice-president of the association, has moved automatically to senior vice-president. These amendments were occasioned by the recent resignation, due to ill health, of President George L. Sitton. The election of a new junior vice-president to replace Mr. Blair will take place at a meeting of the Board of Directors to be held in Chicago on August 4.

Three committee meetings have been scheduled for August. The Committee on Economics of Railway Labor will meet on August 1 at the association headquarters, Chicago, and the Committee on Water Service and Sanitation will meet at the same location on August 8. The Committee on Wood Preservation has scheduled a meeting for August 28 at the Brown Hotel, Louisville, Ky., in conjunction with the annual convention of the Railway Tie Association.

Bridge and Building Association

On July 17 the Executive committee held a meeting at the Engineers' Club, Chicago, primarily to review preliminary drafts of the seven committee reports that are to be presented at the forthcoming convention, to be held at the Stevens Hotel, Chicago, September 18-20. Most of the day was spent in going over these reports, copies of all of which were available. Details of the convention program, as well as routine business, were also discussed.

Lewis Thomas, director of exhibits of the Track Supply Association and the

Bridge and Building Supply Men's Association, and R. G. Betts, president of the latter association, appeared at the meeting and presented a report on the exhibit that is to be presented by these two associations at the Coliseum during the concurrent convention of the Bridge and Building Association and the Roadmasters' Association. The comments of Mr. Thomas and Mr. Betts left no doubt that the exhibit will be of record proportions.

Track Supply Association; B. & B. Supply Men's Association

During July a total of seven additional manufacturers signed up for space in the joint exhibition that is to be held by these two associations during the concurrent annual conventions of the Roadmasters' Association and the American Railway Bridge and Building Association, to be held at Chicago, September 18-20. The result is that, at the time of going to press, 118 manufacturers were planning to participate in the exhibit. These companies will occupy a total of 248 booths. The companies that signed up for space in July are as follows:

Pacific Coast Borax Company, Los Angeles, Cal.
Spaulding Fibre Company, Tonawanda, N. Y.
Eutectic Welding Alloys Corporation, New York.
Chattanooga Welding & Machine Co., Chattanooga, Tenn.
Dow Chemical Company Midland, Mich.
Earl H. Pence & Co., Inc., San Leandro, Cal.
Benbow Fence Tightener Co., Benbow, Cal..

A complete list of the companies that signed for space at the time the June issue went to press was published in that issue. Additional companies which signed for space during June were listed in the July issue. The Rail Joint Company, Inc., New York, which should have been included in the listing in the June issue, was inadvertently omitted.

With a limited amount of exhibit space available additional companies wishing to take part should address their requests to Lewis Thomas, Director of Exhibits, 59 E. Van Buren St., Chicago.

Supply Trade News

General

The **Graver Water Conditioning Company**, New York, has apointed **Evans L. Shuff & Associates**, Atlanta, Ga., as its representative for the Atlanta territory.

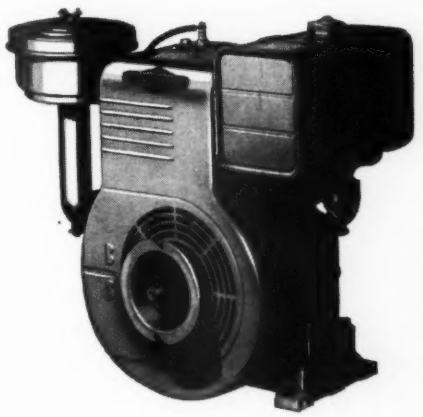
The **Hyster Company** has appointed **J. P. Waite, Inc.**, Milwaukee, Wis., as the dealer for Hyster industrial materials–handling trucks in eastern Wisconsin and northern Michigan.

(Please turn to page 764)

DESIGNED RIGHT . . . BUILT RIGHT FOR

Long Life

AND TOP PERFORMANCE



The sure way to get the best in air-cooled power — insist on Briggs & Stratton, the recognized leader. No other single-cylinder, 4-cycle, air-cooled engines are so universally preferred by manufacturers, dealers, and users alike. This is proved by the fact that there are more Briggs & Stratton engines in service — on farm equipment, industrial machines, tools, and appliances — than all other makes of gasoline engines in their field combined.

BRIGGS & STRATTON CORPORATION, Milwaukee 1, Wis., U. S. A.

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

Preferred Power FOR INDUSTRIAL CONSTRUCTION RAILROAD AND FARM EQUIPMENT

World Wide FACTORY SUPERVISED SERVICE

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

Cut Maintenance Costs . . .

with a Littleford

TRAIL-O-ROLLER

This highly portable Littleford Trail-O-Roller is the answer to low cost maintenance of Crossings, Platforms and Parking Areas. Being a one man roller that travels behind a maintenance truck, the labor saving will pay for this unit in no time.

The Trail-O-Roller is small, compact, yet has as much compaction as a 5 ton tandem, in addition it has a Patented Hydraulic Lift for changing it from the Rolling to Trailing or Trailing to Rolling position. It takes only 2 minutes time to change from one position to another. Dozens of rolling jobs can be done in a single day because the Trail-O-Roller goes right along with the maintenance crew. If you want low cost maintenance work, then you want a Littleford Trail-O-Roller on the job.

LB LITTLEFORD

LITTLEFORD BROS., INC.
471 E. Pearl St., Cincinnati 2, Ohio

Rail-Road Specialist

Only

Burro Cranes Have:

- Fast travel speeds—up to 22 M.P.H.
- Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).
- Elevated Boom Heels for working over high sided gondolas.
- Short tail swing—will not foul adjoining track.
- Low overall height—Burro can be loaded and worked on a standard flat car.

We call Burro Cranes "Railroad Specialists" because they do so many railroad jobs so well. Track work, bridge work, bulk materials handling, Mechanical Stores Department, material handling with or without magnet, are only a few jobs Burro does with speed and economy. Burro Cranes are designed for railroad work—not adapted to it. Watch a Burro work and see why it's called on to do so many jobs by most of the country's railroads.

Burro WORK Power means more EARNING Power

CULLEN-FRIESTEDT CO.
1301 S. Kilbourn Ave., Chicago 23, Ill.

Supply Trade News (Cont'd)

The **Air Reduction Sales Company,** New York, has been appointed national distributor of the recently-introduced Prepo torch for soldering, loosening nuts, sweating cable and other applications.

A new name—Ribbonrail—has been coined by the **Oxweld Railroad Service Company** to designate rail that has been welded into continuous lengths by the oxyacetylene pressure-welding process. The company expects that Ribbonrail will become widely known to the public as well as railroaders as the identifying term for welded rail produced by its process. It is anticipated that well over 100 mi. of track will be laid with Ribbonrail in 1950, and that about 70 per cent of this will be placed in connection with standard programs of rail renewal in open track.

Personal

J. F. Lingeman, assistant to vice-president of the **Dearborn Chemical Company,** has been appointed manager of purchases and production.

Paul H. Davey, Jr., has been elected vice-president in charge of production of the **Davey Compressor Company** Kent, Ohio.

The **Vapor Heating Corporation** has appointed **J. G. Eliasek** to work with railroads at Richmond, Va., Atlanta, Ga., Wilmington, N. C., and other railroad centers in the southeast, with headquarters at Richmond.

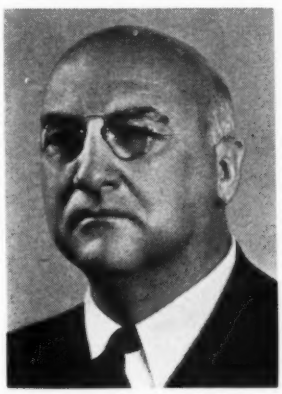
William J. Millett, assistant to the vice-president in charge of manufacturing of the **Worthington Pump & Machinery Corp.,** has been appointed works manager of the Holyoke works to succeed **E. M. Detwiler,** who has resigned.

The **Koehring Company,** Milwaukee, Wis., has announced the appointment of **R. E. Bansemer** as assistant general sales manager, succeeding **John E. Chadwick,** who has joined the **Dalrymple Equipment Company,** distributor of Koehring products in Mississippi. The Koehring Company has also named three new district sales representatives. These are **R. K. Patterson,** who will cover the New England sector; **C. Byron Walker,** the Pacific northwest; and **Al. W. Schlosser,** the southeast.

Horace Zimmer, New York district manager of the apparatus department of the **General Electric Company,** has been appointed manager of districts for the department, with headquarters at Schenectady, N. Y. He will be succeeded by **Frank A. Faron,** formerly New York district's industrial divisions manager. **A. K. Bushman,** fomerly manager of the application and service engineering divisions of the apparatus department, has been appointed mana-

ger of industry divisions in the sales organization of the department, also at Schenectady. **Francis E. Fairman,** formerly manager of sales for the department's transformer and allied products divisions at Pittsfield, Mass., has been appointed general sales manager of large apparatus divisions, at Schenectady, and **Arthur W. Bartling,** former manager of sales for the department's fractional-horsepower motor divisions in Fort Wayne, Ind., has been appointed general sales manager of small apparatus divisions in the department, with headquarters at Lynn, Mass. Both of the latter positions are newly established.

Charles W. Bryan, Jr. has been elected president of the **Pullman Standard Car Manufacturing Company,** Chicago, succeeding **Champ Carry**, who will continue to be associated directly with the company as chairman of its board of directors, and will continue as president of **Pullman, Inc.,** the parent company. Mr. Bryan was formerly associated with the Federal Shipbuilding & Dry Dock Co., of which he was vice-president and general manager in 1948. In 1949 he was loaned to the Economic Cooperation Administration and served in Italy with an E.C.A. mission as consultant on shipbuilding and shipping matters.



Charles W. Bryan, Jr.

William A. Meiter, manager of the Buffalo (N.Y.) district sales office of the **Worthington Pump & Machinery Corp.,** has been appointed central sales manager, a newly-created position. In his new position Mr. Meiter will have his headquarters in Detroit, Mich., and will direct the sales activities of the Worthington offices at Buffalo, Detroit, Cleveland, Ohio, Cincinnati, Ohio, and Pittsburgh, Pa. His successor as manager of the Buffalo district sale office is **John W. Stovall.** Mr. Meiter graduated from Ohio State University in 1927 and became a member of the Worthington training class of that year. Later he was appointed sales engineer in the Cleveland district sales office and was named manager of the Buffalo office in 1938, holding this position until his recent promotion.

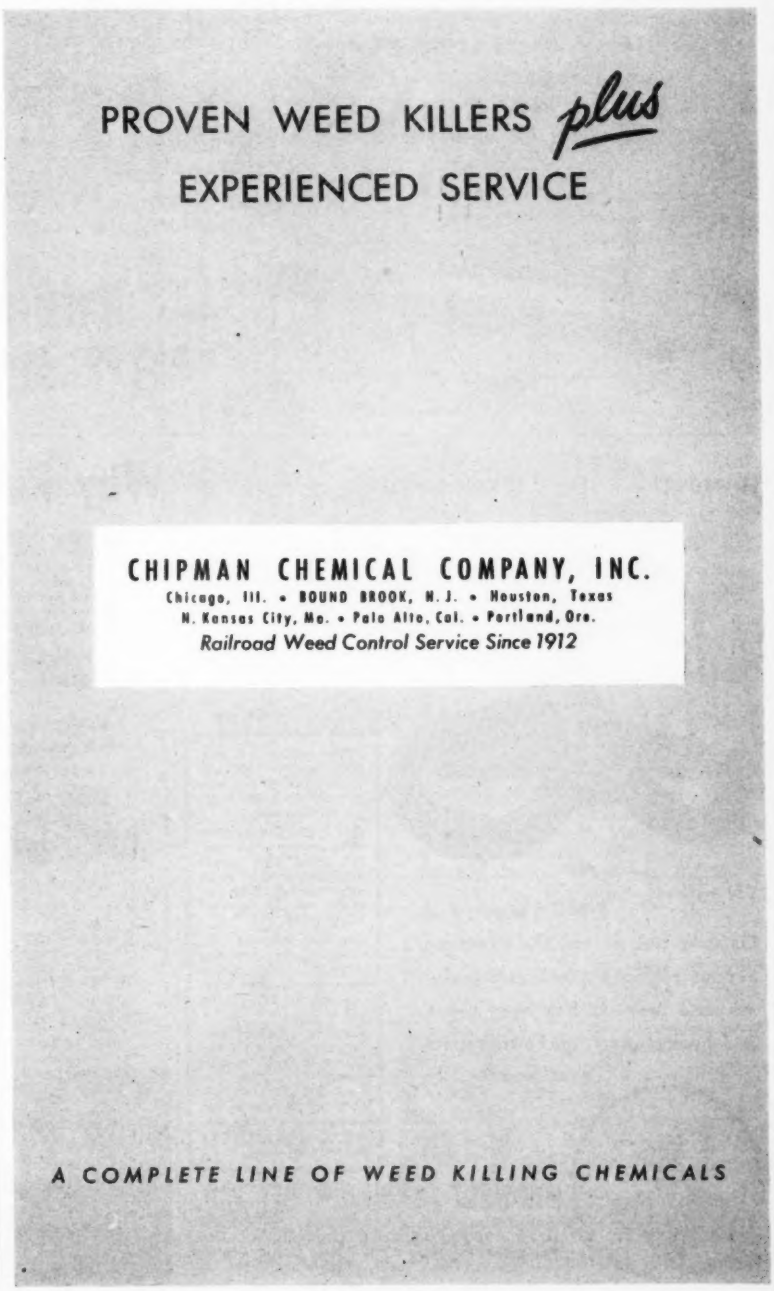
Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 703)

Allis-Chalmers Tractors—The Allis-Chalmers Manufacturing Company, Tractor Division, has published a 20-page pocket-size booklet giving the specifications and a brief description of each Allis-Chalmers power unit, wheel tractor and crawler tractor. Emphasized in the catalog is the importance of choosing equipment to fit the job.

Timber Research—The Timber Engineering Company has published a 12-page booklet entitled Research Facilities for the Lumber and Wood Using Industries, which briefly describes this company's research functions and facilities in the fields of wood-product development, engineering and wood chemistry.

Orton Equipment—The Orton Crane & Shovel Co. is offering a four page bulletin, designated as No. 81, describing a new combination crane and pile driver with which one operator can carry out all the necessary lifting work at a bridge job, such as setting caps or trusses, as well as the pile-driving work. The bulletin also describes the Orton B3 pile driver with a horizontal truss and collapsing leads.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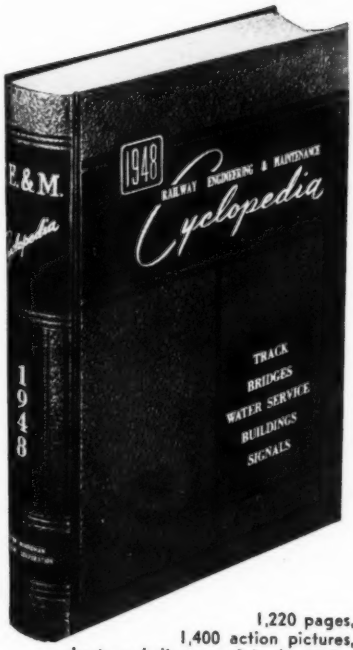

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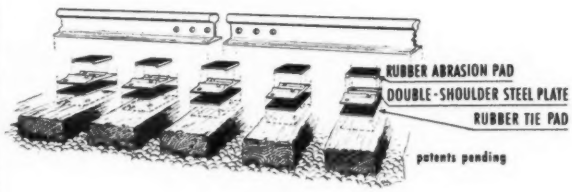

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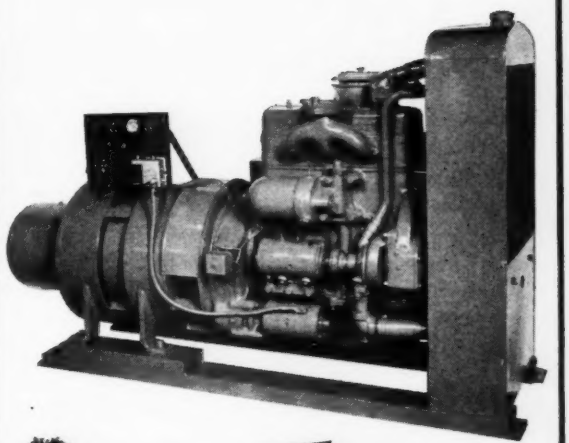

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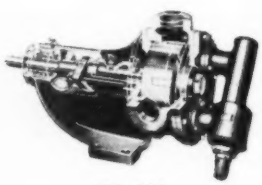

FIG. 124

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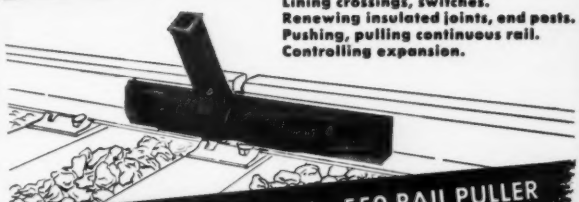

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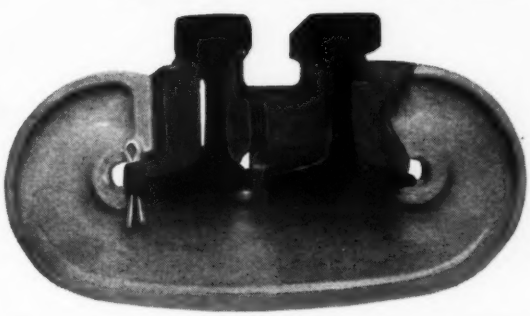

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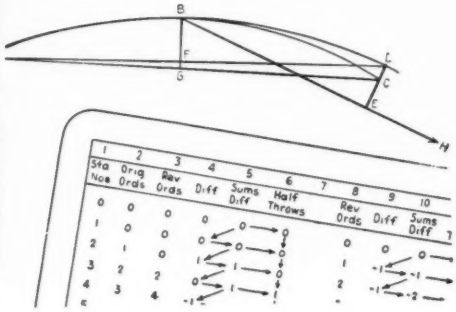

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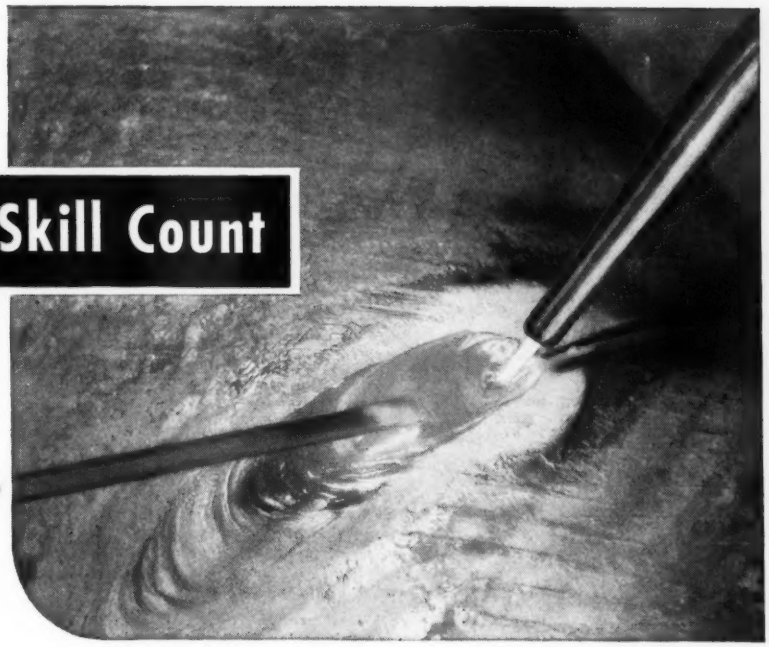

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CRIBEX	
Total half-Cribs excavated	78,151
Total full Cribs excavated	39,076
Total miles cribbed	12.21
Average half-Cribs excavated per Cribex per working hour	108.4
Average track feet half-cribbed per working day	3700
Average track feet fully cribbed per working day	1850
BALLASTEX-SCREENEX	
Total feet cleaned, Shoulder Side	60,867
Total feet cleaned, Intertrack Side	81,187
Average feet per working hour, Shoulder Side	951.0
Average feet per working hour, Intertrack Side	904.1
Average track feet (both sides) per working day	2089

These results were accomplished by the Nordberg "Threesome" with a foreman and 22 men . . . none of whom had ever seen these machines before. The best day's production with the Cribex was 2,829 half-cribs in 5½ hours actual on-track time. Best production for the Ballastex-Screenex on shoulder was 5,538 ft. in 5½ hours. Best intertrack production was 5,280 ft. in 4½ hours.

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